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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2 290 BROADWAY NEW YORK, NY 10007-1866

AUG 17 2007

To All Interested Government Agencies and Public Groups:

In accordance with the U.S. Environmental Protection Agency's (EPA) procedures for the preparation of environmental impact statements (EIS), an environmental review has been performed on the proposed agency action below:

Project Name:

Ocean Harvest Aquaculture Inc. (OHAI), NPDES Permit for New Source Discharge from an Offshore Concentrated Aquatic Animal Production Facility

Purpose of Project:

OHAI's proposed facility is intended to offset a small part of the seafood demand in Puerto Rico, other Caribbean Islands and the United States mainland. OHAI's goals also include expanding the understanding of cobia as an openocean aquaculture species, and developing new technologies that could potentially be applied to other commercially important marine fish species. OHAI would also be contributing to the achievement of the National Oceanic and Atmospheric Administration's (NOAA) efforts to promote offshore aquaculture in the exclusive economic zone (EEZ) to reduce pressure on natural

fisheries.

Project Originator:

Ocean Harvest Aquaculture Inc., Humacao, P.R. 00791

Project Location:

The offshore portion of the project is approximately 2 miles

into the Caribbean Sea off the coast of Punta Guayanes,

coordinates (WGS84 datum): 18.054983° N

65.771083° W. The onshore portion of the project is at Yabucoa Harbor, adjacent to the Old Union Carbide trans-

shipment structure and dock in Puerto Rico.

Project Description:

OHAI proposes to construct and operate a commercialscale, open-ocean aquaculture production facility and land-

based hatchery and operations facility along the

southeastern shoreline of Puerto Rico.

Based on information provided by OHAI and other existing information, our assessment indicates that no significant adverse environmental impacts will result from the proposed action provided that the following measures are implemented:

- Applicant must implement the May 11, 2005, Final Environmental Monitoring Plan approved by the National Marine Fisheries Service (NMFS) and the U.S. Army Corps of Engineers (COE). Additionally, applicant must send to EPA a copy of the resulting monitoring data.
- Applicant must test groundwater for *polycyclic aromatic hydrocarbons* (PAHs), arsenic and *petrochemicals* at the onshore site where the intake well is planned. A plan for quarterly sampling must be developed and sent to EPA for review. The approved plan must be implemented as soon as the well starts operation and data sent to EPA as it is collected.
- Applicant should test onshore site soil for *polycyclic aromatic hydrocarbons* (PAHs), arsenic and *petrochemicals* to provide for the identification and mitigation of any potential risk from industrial contamination at the onshore site during construction activities. All data should be sent to EPA.

While no significant impact is anticipated, EPA finds it necessary to gather site-specific data given that large-scale aquaculture is a relatively new activity in Puerto Rico and that aquaculture practices and local natural conditions vary. This data will be used to inform future permit decisions. Furthermore, EPA requires that the applicant obtain a Coastal Zone Management Consistency Certificate from the Puerto Rico Planning Board. Before EPA finalizes its permit decision, the applicant must provide a copy of the certificate to EPA and must agree to perform the following monitoring and reporting practices:

- Applicant will notify EPA of any disease outbreaks or fish kills.
- Applicant will not add any other species prior to NMFS approval and each approval is sent to EPA.
- Applicant must provide EPA with a quarterly report of all feeds, chemicals and antibiotics used in offshore and onshore facilities.
- The above stated measures must be implemented from project initiation until the initial permit expires. Measures may be extended at the time of permit renewal if EPA data analysis demonstrates the need for future monitoring and reporting.

We have made a decision not to prepare an EIS on the project. This decision is based on a careful review of the project's environmental information document and other supporting information. All of these documents, along with the EA (copy enclosed) are on file at the offices of the EPA Region 2, where they are available for public scrutiny upon request. The EA is also available on EPA Region 2's website at http://www.epa.gov/region02/spmm/r2nepa.htm.

Comments supporting or disagreeing with this decision may be submitted to EPA for consideration. All comments must be received within 30 calendar days of the date of this FONSI. Please address your comments to: Grace Musumeci, Chief, Environmental Review Section, at the above address. No administrative action will be taken on the project for at least 30 calendar days after the date of this FONSI.

Sincerely,

Alan J. Steinberg

Regional Administrator

Enclosure

OCEAN HARVEST INC. NPDES PERMIT for NEW SOURCE DISCHARGE from an OFFSHORE

DISCHARGE from an OFFSHORE CONCENTRATED AQUATIC ANIMAL PRODUCTION FACILITY

Environmental Assessment

JULY 2007

Environmental Assessment

Ocean Harvest Aquaculture Inc. , Humacao, Puerto Rico

NPDES Permit for New Source Discharge from an Offshore Concentrated
Aquatic Animal Production Facility

Prepared pursuant to:

National Environmental Policy Act, 42 USC 4322,
CEQ Regulations for Implementing NEPA, 40 CFR 1500, &
EPA Regulations for Implementing NEPA, 40 CFR 6.

U.S. Environmental Protection Agency, Region 2July 2007

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1.0 INTRODUCTION

Ocean Harvest Aquaculture, Inc. (OHAI) proposes to construct and operate a commercial-scale, open-ocean aquaculture production facility and land-based hatchery and operations facility along the southeastern shoreline of Puerto Rico off Punta Guayanes. The aquaculture facility and hatchery would be used for the culture of cobia. Cobia (*Rachycentron canadum*) is a pelagic fish species found worldwide in tropical and subtropical ocean and estuarine waters.

The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The NPDES regulations (40 CFR 122.24 and Appendix C to Part 122) specify the applicability of the NPDES permit requirement to concentrated aquatic animal production (CAAP) facilities. Hatcheries and fish farms are classified as CAAPs when they meet the following conditions (40 CFR 122, Appendix C) or are designated as a CAAP under 40 CFR 122.24(c):

A hatchery, fish farm, or other facility is a concentrated aquatic animal production facility if it contains, grows, or holds aquatic animals in either of the following categories:

- (a) Cold water fish species or other cold water aquatic animals in ponds, raceways, or other similar structures which discharge at least 30 days per year but does not include:
 - (1) Facilities which produce less than 9,090 harvest weight kilograms (approximately 20,000 pounds) of aquatic animals per year; and
 - (2) Facilities which feed less than 2,272 kilograms (approximately 5,000 pounds) of food during the calendar month of maximum feeding.
- (b) Warm water fish species or other warm water aquatic animals in ponds, raceways, or other harvestable similar structures which discharge at least 30 days per year, but does not include:
 - (1) Closed ponds which discharge only during periods of excess runoff; or
 - (2) Facilities which produce less than 45,454 harvest weight kilograms (approximately 100,000 pounds) of aquatic animals per year.

EPA published a final rule (Federal Register Volume 69, Number 162, 51891-51930) for effluent limitations and new source performance standards for CAAP sources. The new rule (40 CFR 451) applies to discharges from CAAP facilities that produce 100,000 pounds or more per year of aquatic animals utilizing a flow-through, recirculating, net pen system or a submerged cage system. The proposed OHAI facility would be classified as a CAAP and would be required to meet the requirements of this new rule, as the proposed project would produce 2,200,656 pounds of fish per year. The proposed onshore facility does not exceed the threshold to be classified as a CAAP. The NPDES application for the onshore facility submitted under October 20, 2004 cover letter reports that it would produce 3,300 pounds per year harvestable weight. As of this date, EPA has not designated the hatchery as a CAAP under 40 CFR

122.24(c) (i.e., not considered a significant contributor of pollution to waters of the United States).

The CAAP new source standards for attaining effluent limitations focus on the facility operator's use of best practicable control technology (BPT) currently available and associated practices related to feeds management; waste collection and disposal; transport or harvest discharge; carcass removal, materials storage, structural and facility maintenance, recordkeeping and training. All CAAP operators are required to develop and maintain a best management practices (BMP) plan documenting how the facility will achieve the requirements of 40 CFR 451 and any individual permit conditions.

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to construct and operate a commercial-scale, open-ocean aquaculture production facility and land-based hatchery and operations facility along the southeastern shoreline of Puerto Rico.

Overexploitation of marine resources, pollution and habitat destruction exacerbated by human population growths have caused fishery depletion in the Caribbean and throughout the world. Fishery operations in Puerto Rico have exceeded maximum sustainable yields and suffer due to ocean pollution and destruction of suitable habitat for native species. Today, Puerto Rican fisheries supply less than five percent of the island's demand for seafood, with imports supplying the remainder (OHAI 2005).

The National Oceanic and Atmospheric Administration (NOAA) is promoting offshore aquaculture in the exclusive economic zone (EEZ) to reduce pressure on natural fisheries. Offshore aquaculture practices have been evaluated and refined through a recent demonstration project in Culebra, Puerto Rico and the six-year Cates International Inc. aquaculture project in Hawaii. Offshore aquaculture has the potential to expand the aquaculture industry with fewer user conflicts than shoreline operations, and reduced environmental impacts.

OHAI was incorporated as a private corporation in Puerto Rico in 2003, with the mission "to develop a commercial and environmentally sustainable open-ocean aquaculture industry in the Caribbean, specifically with cobia (Rachycentron canadum)." OHAI is working in conjunction with the Palmas del Mar Fisherman's Association, the Department of Marine Sciences at the University of Puerto Rico, the State Sea Grant College Program, Ocean Spar Technologies, the Aquaculture Center of the Florida Keys, Inc., Mariculture Technologies International, Inc., and Fundación Chile to bring technology developed for the aquaculture of cobia to the commercial scale required for profitability. Cobia produced at OHAI's proposed facility could offset a small part of the seafood demand in Puerto Rico, other Caribbean Islands and the United States mainland. OHAI's goals also include expanding the understanding of cobia as an open-ocean aquaculture species, and developing new technologies that could potentially be applied to other commercially important marine fish species [e.g., greater amberjack (*Seriola dumerili*) and red hind (*Ephinephelus guttatus*)].

3.0 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

To make a decision concerning a permit to discharge into the waters of the U.S. under the NPDES program for the offshore aquaculture production facility, the EPA must determine the environmental consequences of the proposed project including the associated onshore hatchery and fish processing plant. Upon completion of this environmental assessment (EA), the EPA will either prepare a finding of no significant impact (FONSI) and issue a NPDES permit, or complete an environmental impact statement (EIS) to further investigate project impacts before making a final NPDES permit decision.

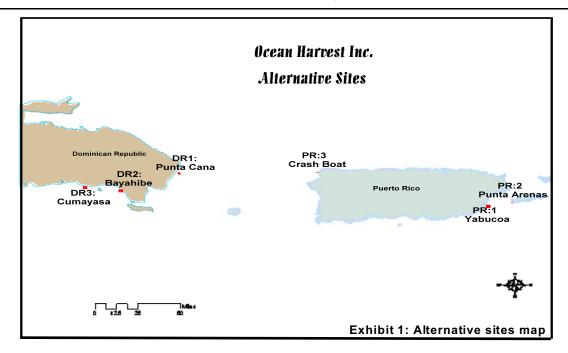
EPA has prepared this EA to support agency decision making concerning the potential issuance of a NPDES permit for OHAI to operate an open-ocean aquaculture facility off the coast of Punta Guayanes, Puerto Rico. The analyses in this EA are restricted to resources that could potentially be impacted by the proposed action including the associated onshore hatchery and fish processing plant. EPA prepared this EA in compliance with NEPA regulations of the Council on Environmental Quality (40 CFR 1500-1508) and EPA's NEPA implementing regulations (40 CFR 6).

4.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

4.1 Preliminary Aquaculture Sites

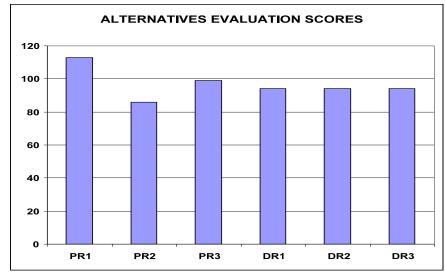
OHAI conducted preliminary research to determine the potential feasibility for development of commercial-scale aquaculture at sites offshore of Puerto Rico (PR) and the Dominican Republic (Exhibit 1). Six feasible offshore sites were identified for further preliminary investigation. These sites included:

PR1 : located 2 miles off Palmas Del Mar/Yabucoa, P.R. bearing 150 degrees.
PR2: located 2.5 miles off Punta Arenas, Vieques bearing 195 degrees.
PR3: located 1.9 miles off Crash Boat, P.R. bearing 311 degrees.
DR1: located 1.8 miles off Punta Cana Resort, Dominican Republic.
DR2 : located 1.5 miles off Bayahibe, Dominican Republic bearing 155 degrees.
DR3: located 1.8 miles off Cumayasa, Dominican Republic bearing 245 degrees.



Evaluation criteria (social and environmental) were determined, and a ranking process was developed to evaluate the sites. Any of the proposed sites ranking over 100 points was considered for further analysis. The project team collected data, and conducted baseline sampling and dive surveys at the six potential sites. Graph 1 displays the results from the evaluation process (*Appendix F*). The ranking and evaluation resulted in the selection of the

PR1 site for further analysis (OHAI 2005). The selection of PR1 was the result of a combination of factors. with no single factor predominating. The strengths of the site included the strong level of community support, availability of a technically skilled workforce in conjunction with good transportation. PR1 is not located near



Graph: 1

sensitive coastal areas (e.g., coral reefs, mangroves), has low potential for predation and has optimal wind and current velocities. The availability of electricity, communication and

transportation infrastructure, especially the adjacent road, were strong factors in identification of PR1 as the preferred location for the proposed action.

In comparison, the PR2 site was closer in proximity to sensitive coastal areas, fewer favorable sites for a hatchery facility existed and fewer technically skilled workers were available in comparison to PR1. The lack of transportation, communication and electricity infrastructure was a strong negative factor in the elimination of PR2.

The PR3 site was eliminated mainly for its relatively high wind velocity, fewer options for creating a fallowing area, and closer proximity to sensitive coastal areas. PR3 was also judged to have a higher potential for shark predation.

The main factor in the elimination of the DR1 site was its proximity to sensitive coral reefs. However, DR1 had other problems, including higher wind velocity, greater potential for shark predation and less optimal current patterns. Municipal and industrial runoff pollution in the area and the infeasibility of siting a hatchery contributed to the site's elimination.

DR2 was located too close to the Dominican Republic's Federal Nature Preserve. The site did not have available infrastructure or a readily available freshwater source for the hatchery. Fewer options existed for a fallowing area and the potential for shark predation was judged to be greater than other sites. In addition, the potential for poaching, vandalism, and conflicts with tourism activities were factors in the elimination of the site. The presence of overly strong currents and the potential for shark predation contributed to the elimination of DR3.

4.2 Alternatives Retained for Detailed Study

The alternatives further evaluated in the EA include the no action alternative and the applicant's proposed alternative (PR1 site) for the construction and operation of the proposed CAAP facility.

4.2.1 No Action Alternative

The no action alternative consists of not constructing and operating a commercial-scale, openocean aquaculture production facility and land-based hatchery and operations facility along the southeastern shoreline of Puerto Rico. Under the no action alternative, EPA would not issue a NPDES permit for the proposed OHAI project. In the absence of a permit, it is assumed that the project would not be constructed.

The no action alternative would not contribute towards achieving NOAA's goal to promote offshore aquaculture in the exclusive economic zone (EEZ) to reduce pressure on natural fisheries. The no action alternative does not provide an opportunity to offset any part of the seafood demand in Puerto Rico and the larger region. The no action alternative would not support a greater understanding of cobia as an open-ocean aquaculture species, or develop new technologies that could potentially be applied to other commercially important marine fish species.

The no action alternative would not provide new employment or introduce new technology to the

Yabucoa region, which has suffered economic losses due to the decline of the local sugarcane industry over the past two decades. The University of Puerto Rico would not have the opportunity to conduct research and provide educational opportunities at an offshore aquaculture facility.

4.2.2 **Proposed Alternative**

OHAI proposes to construct and operate a commercial-scale, open-ocean aquaculture production facility and land-based hatchery and operations facility along the southeastern shoreline of Puerto Rico, off Punta Guayanes, between the municipalities of Humacao and Yabucoa (*Exhibit 2*).

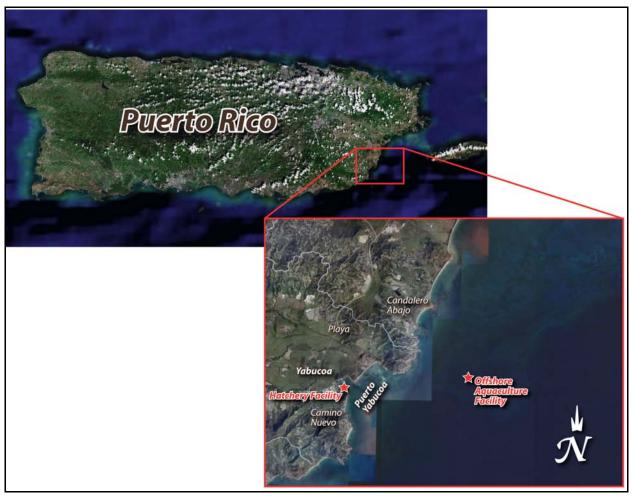


Exhibit 2: Project location map

Offshore Components

The offshore aquaculture facility would utilize a square grid of open-ocean, approximately 2.0 miles offshore, with a center point of N 18° 03'17.9 northing; W 65° 46'15.9 easting. The offshore area ranges from 105-115 feet in depth, with an average depth of 108 feet. The area has a sandy, flat sea floor bottom with average naturally-occurring water current between 0.6 foot/second (0.35 knot) and 1.7 feet/second (1.0 knot). The grid would be a square area of

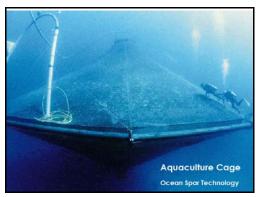


Exhibit 3: Typical aquaculture cage

approximately 1,640 feet per side, for a total area of approximately 62 acres. When fully operational, the offshore site would contain 10 six-acre cages, anchored into the soft bottom substrate. The diamond- shaped cages (Exhibit 3) would be approximately 82 feet in diameter, 42 feet in height and 75 feet wide in the middle. The cages would be constructed of synthetic mesh, with a net depth of 50 feet, and would be connected to a steel pipe framework. The total volume of each cage would be approximately 106,000 cubic feet. The cages would be placed at approximately 108 feet in depth and would be secured to the bottom using a four-point

mooring system consisting of four 3,000 pounds, 9 feet wide anchors and an 8 feet diameter main central ballast that would rest on the sea floor. The cages will be launched from Yabucoa Harbor and towed approximately 3.5 miles to the site.

When fully operational, the aquaculture facility would have a production harvest of approximately 2,200,656 pounds of fish per year. The facility would also result in the production of approximately 550,164 pounds of fish offal annually.

Onshore Components

The land-based facility would require the lease of approximately 2 acres of Puerto Rico Ports Authority land along Yabucoa Harbor, adjacent to the Old Union Carbide transshipment structure and dock (Exhibit 4). The facility would be centered in a 5,000 square feet concrete warehouse (Appendix A) and also include:

areas for loading of feed and off-loading of harvested fish,
operations office and parking areas,
a floating dock system 70 feet long,
restoration of an existing 35 feet boat ramp,
hatchery,
installation of seawater intake pipe and outfall pipe, and

gated chain-link fence topped with barbed and razor wire.

The hatchery would be operated as a closed-loop holding system known as a recirculating systems or RAS (recirculating aquaculture systems). Recirculating systems filter and clean water for recycling back through fish culture tanks. Water contained in the system is circulated from the tank(s) containing the species, through a series of components that reduce or remove



Exhibit 4: Site of proposed hatchery

chemical and biological waste in its gas, liquid and solid form. The cleaned water is then returned to the holding tanks. New water is added to the tanks only to make up for splash out and evaporation and for that used to flush out waste materials. New water would be drawn from a two-inch wide saltwater intake pipe extending approximately 60 feet out from shore. The influent saltwater requirement for the hatchery would be less than 1 gallon per minute (gpm). The water would be cartridge filtered, ozonated, destructed and UV sterilized prior to use within the facility. A 10.16 centimeter (4 inch) outfall pipe would discharge treated effluent (see Section 6.3, Water Quality).

The four critical processes in a recirculation system are solids removal, nitrification, gas exchange and disinfection. The nitrification process is required to convert the ammonia contained in fish waste, which is toxic at low concentrations, into nitrate, which is far less toxic even at higher concentrations. Gas exchange is required to strip excess carbon dioxide from the water and replace oxygen lost through fish respiration and biofilter activity.

The OHAI hatchery system would deploy automatic monitoring and control of water quality factors such as temperature, dissolved oxygen, oxygen reduction potential, acid/base balance and conductivity. The hatchery system to be utilized can maintain the aquatic environment within narrow water chemistry bounds with very low water use (OHAI 2005).

5.0 AFFECTED ENVIRONMENT

Because the proposed project consists of both onshore and offshore facilities, the project area is composed of two distinct areas. The offshore portion of the project area consists of the 62-acre proposed project site. The onshore portion of the project area consists of the two-acre parcel of land under consideration for the hatchery facility and operations office. For the analysis of certain resources, both the onshore and offshore project areas have been expanded to encompass the area of potential effect (*Table 1*).

Table 1: Project Area by resource

	Natural Environment	Cumulative Effects
Offshore	62 acre proposed site	62 acre site plus 1.0 kilometer area centered on cage location
Onshore	2 acre proposed site and adjacent harbor area	Yabucoa Harbor

5.1 Physical Geography, Geology and Soils

Puerto Rico and its satellite islands are located in the northeastern Caribbean Sea region. Puerto Rico is the easternmost island of the chain of large islands that forms the Greater Antilles. Puerto Rico is shaped roughly like a rectangle (110 miles in length from east to west and 40 miles in length north to south) and forms the western half of the Puerto Rico-Virgin Island platform. Together with the Lesser Antilles, the islands of the Greater Antilles geographically separate the Atlantic Ocean and the Caribbean Sea.

Puerto Rico is surrounded by an insular shelf in which the water depth is less than 650 feet. The insular shelf is narrow, varying in width from less than 1.2 miles northwest of the island to greater than 15 miles southwest of the island. A precipitous shelf break borders the island on three sides at depths less than 650 feet (USGS 2002).

According to the U.S. Geological Survey (USGS 2002), the onshore project area is located in the Alluvial Coastal Plain physiographic province. Flat-lying coastal plains and alluvial valleys compose a discontinuous belt around much of the periphery of the island. The coastal plain is especially prominent along part of the south coast where coalescing fan deltas were deposited by adjacent streams to form a broad, continuous plain (USGS 1996).

The Yabucoa Valley is a broad, 12 square mile valley incised into the granodiorite of the San Lorenzo Batholith (igneous intrusive rock). Boulder-to-clay size alluvial fan fanglomerates dominate the landward margin of the valley, but in the central part of the valley these sediments grade to alluvial plain deposits of stratified, poorly consolidated sand, silt, and clay, with scattered pebbles and boulders. The thickness of the alluvial deposits is reported to be as much as 320 feet, but typically averages less than 160 feet near the coast (USGS 2005).

Topographic contours within the onshore project area range from 3 feet to 6 feet above mean sea level. Soils within the onshore project area are primarily sandy, but fill material, including garbage, was found in the area during sampling conducted for the project. The soil in the onshore project area has been impacted by the cleaning and maintenance of adjacent dirt roads, mechanized accumulation of sand and fill material and the current refuse dumping in the area

(OHAI 2005).

5.2 Water Resources

5.2.1 Surface Waters

The offshore portion of the project is located within a 62 square mile area of the Carribean Sea approximately two miles southeast of Palmas del Mar Marina, Humacao, Puerto Rico. Water depths in this area range from 105-115 feet (USGS 2003). The offshore site has a sandy, flat sea floor bottom with an average, naturally-occurring water current, the Vieques Passage tidal current, near 0.6 foot/second (0.35 knot) and a maximum current of no more than 1.7 feet/second (1 knot). The current pattern is strongly modulated by the Roosevelt Roads and Maunabo tides, and is of a semidiurnal nature oriented in approximately the 260 degree to 280 degree major axis true. Maximum wave heights generally are not expected to exceed 6.5 feet under normal circumstances (OHAI 2005).

The Yabucoa Harbor, which opens into the Caribbean Sea, borders the onshore project area to the north. No rivers classified as wild and scenic by the Wild and Scenic Rivers Act are located within or near the onshore project area.

5.2.2 Groundwater

The onshore components are located within the East Coast groundwater province of Puerto Rico. The East Coast groundwater province is indented by several alluvial valleys, including the Yabucoa Valley, in which the onshore project area is located.

The water table lies at or near land surface in the Yabucoa Alluvial Valley. The contribution to groundwater from volcanic and plutonic rocks in the mountain and upland areas to alluvial aquifers is relatively small compared to the total quantity of groundwater in the valley. Water levels within the alluvial aquifers vary from 100 feet above mean sea level near the bedrock-alluvium contact to near mean sea level in coastal areas. Although the water table fluctuates seasonally due to rainfall, pumpage has caused major overall declines in the Yabucoa basin. The water table is generally at its lowest elevation during the dry months of March and April and at its highest elevation in September. In the Yabucoa basin, groundwater in the alluvial aquifers flows east towards the coast (USGS 1996).

5.3 Water Quality

The offshore components would be located in the Caribbean Sea, approximately 2 miles from the Puerto Rico coast line. Existing water quality parameters of the offshore project area are shown in *Table 2*, where dissolved oxygen ranges for the offshore study area, were within acceptable ranges for biota respiratory requirements (EPA 2007) during May 2004 sampling.

Stratified (bottom and surface) water quality sampling, conducted during May 2004, showed low concentrations of ammonium, nitrates, nitrites, and phosphorous (OHAI 2005). High concentrations of these nutrients, particularly nitrates and phosphorous, can cause eutrophication in marine environments.

Table 2: Water quality of offshore area

Parameter	Center*	NW*	SE*
Temperature (C°)	27.0	27.0	27.1
Conductivity (mS/cm)	45.0	45.0	45.0
Salinity (ppt)	34.1	34.2	34.2
Dissolved oxygen saturation (%)	125.8	129.5	116.6
Dissolved oxygen (milligrams/liter)	7.0	7.2	6.5
Chlorophyll a (micrograms/liter)	0.0	0.0	0.0
Depth (meters)	12.7	13.1	14.1
Turbidity (NTU)	2.2	2.0	2.0

^{*} Sampling from center, northwest corner and southeast corner of proposed open-ocean cage site

Water quality in Yabucoa Harbor is currently compromised by heavy siltation and the effects of industrial activities. Yabucoa Harbor was identified as a category 1 and 2 impaired coastal water (meeting only some of its designated water quality uses) in the 2002 Puerto Rico Clean Water Act section 305b Water Quality Inventory and Integrated Report (Puerto Rico Environmental Quality Board 2003).

5.4 Wetlands

A wetland investigation conducted for the proposed project found no wetlands present in the onshore project area (Appendix B). One facultative plant specie (occurring in wetlands or nonwetlands 34 to 66% of the time), tamarindillo (Leucaena leucocephala), was found in the project area. The project area has been disturbed for anthropogenic purposes many times. Although hydric soil indicators, as well as wetland hydrology indicators, were found in two sampling points, the dominant vegetation, hierba de guinea (Panicum maximum), is not considered a wetland species. Other vegetation at the site is mostly found in upland areas.

Depressions within the project area were created by the mechanized movement of soil and deposition of fill. These depressions do not show a surface water connection to any regulated waters of the U.S., though they are relatively close to the Yabucoa Harbor.

5.5 Floodplains and Coastal Zone Management

The onshore hatchery facility is located within the "special flood hazard areas subject to inundation by the 1% annual chance flood" (i.e., 100-year flood) according to the Federal Emergency Management Agency (FEMA) (FIRM 72000C1815H). Because the project area is in a low-lying coastal area (*Exhibit 5*), most of the surrounding region also falls within the 100-year floodplain.

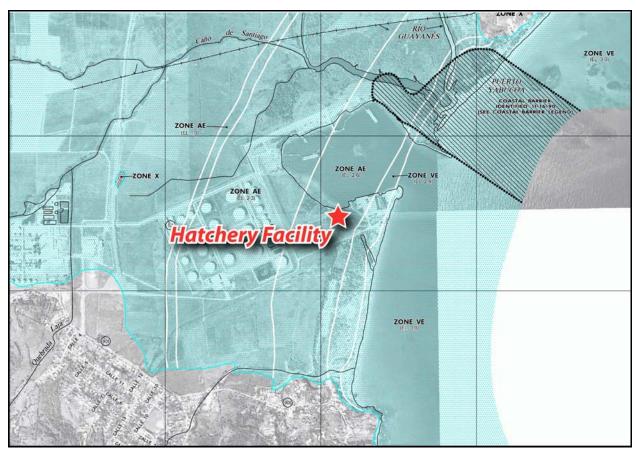


Exhibit 5: Floodplain map

The Puerto Rico coastal zone generally extends 0.6 mile inland and 3 miles out to sea; therefore the proposed action is within the coastal zone and is subject to the consistency requirements of the Coastal Zone Management Act of 1972 as enacted through the Puerto Rico Coastal Management Program. Activities of the program include permitting, development review and enforcement, natural reserve designation and management, public education, coastal access, coastal reef management and non-point pollution management.

5.6 **Air Quality and Noise**

EPA has set national ambient air quality standards (NAAQS) for six common pollutants, commonly referred to as "criteria" pollutants. They include ozone (O_3) , particulate matter, carbon monoxide (CO), nitrogen dioxide (NO_2) , sulfur dioxide (SO_2) and lead (Pb). An area that is in non-attainment does not meet the national primary or secondary ambient air quality standard for criteria pollutants. The project area is currently in attainment for all criteria pollutants under NAAQS (EPA 2006).

The Noise Control Act of 1972 declares the policy of the United States to promote an environment free from noise that jeopardizes health or welfare. Sensitive receptors for unwanted noise include residential areas and community facilities such as schools, hospitals, and parks. The nearest sensitive receptor to the onshore project area is a residential area located approximately 0.6 mile to the west.

5.7 Terrestrial Vegetation

Dominant vegetation in the onshore project area (*Table 3*) includes non-native upland species, which rapidly invade areas where existing vegetation has been removed for anthropogenic purposes.

Common Name	Scientific Name	Stratum	Indicator
Tamarindillo	Leucaena leucocephala	Tree	Facultative
Sweet acacia	Acacia farnesiana	Tree	Upland
Guama americano	Pithecelobium dulce	Tree	Upland
Hierba de guinea	Panicum maximum	Herb	Facultative

Table 3: Dominant plant species within the onshore project area

5.8 Aquatic Resources

Aquatic macroinvertebrates within the offshore project area include a variety of polychaetes and mollusks. Fish sampling conducted by OHAI in the offshore project area during May 2004 found the following fish species: bicolor damselfish (*Stegastes partitus*); Carajuelo, candil gatillo, or squirrelfish (*Holocentrus adsencionis*); harlequin bass (*Serranus tigrinus*); grey angelfish (*Pomacanthus arcuatus*); and snapper (*Lutjanus sp.*).

The essential fish habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801-1882), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Coral reefs are designated as EFH due to their importance in providing essential spawning, nursery, forage, and refuge functions for federally managed species, such as juvenile and adult Nassau grouper and schoolmaster, juvenile mutton snapper and adult squirrelfish and banded butterfly fish. The offshore project area is

located approximately 0.6 mile to the southwest of the nearest coral reef. Another coral reef is located approximately 1 mile to the northeast of the offshore project area.

A visual census was conducted along three 9.7 meter (32 feet) transects at each reef location to survey the composition and abundance of coral, macroalgae, sponges and fish. The census revealed that both reefs are similar in the abundance and diversity of these organisms. Both reefs had a dominance of octocorals with some small colonies of Sleractiniumus corals. A small percentage (15%) of the reef coverage was composed of turf algae and filamentus algae. Dictyotaceae was the dominant genus of macroalgae observed and Peyssonnelia was the most abundant encrusted algae. Sponges represented only a small proportion of the organisms observed at the two reefs (OHAI 2005).

The onshore project area is bordered by Yabucoa Harbor. The portion of the harbor bordering the project area is characterized by shallow water with relatively high turbidity. The harbor has previously been subject to dredging activities. The bottom is rocky, sediments are mainly sand, with fragments of dead organisms (mollusk shells, corals, etc). An approximately 4 square meter (43 square feet) patch of turtle grass (*Thalassia testudinum*) and another dispersed 12 square meter (130 square feet) patch of cord grass (*Spartina sp.*) were observed during May 2004 sampling for the proposed project. Some dispersed corals were observed, although most were dying from sedimentation. Small patches of *Halimeda*, an algal species typical of oligothropic (low nutrient) waters, were also observed. Macroinvertebrate sampling at the onshore project area identified one mollusk (*family Tellinidae*) and two polychaetes organisms. Most of the sample consisted of mud sediment.

5.9 Endangered, Threatened and other Protected Species

Coordination with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) was initiated for threatened, endangered and other protected species potentially present in the onshore and offshore project area (*Appendix C, NMFS 2006*). Species of concern with the potential to be present are shown in *Table 4*.

Consultations with the NMFS and USFWS indicate that the offshore project area is not located in critical habitat for any threatened or endangered species. Certain species of sea turtles, including the Loggerhead (*Caretta carretta*), Green (*Chelonia mydas*), Leatherback (*Dermochelys coriacea*), Hawksbill (*Eretmochelys imbricate*), Olive Ridley (*Lepidochelys olivacea*), and Kemp's Ridley (*Lepidochelys kempii*) are known to occur in the waters of Puerto Rico and the U.S. Virgin Islands. However, Kemp's and Olive Ridleys are rarely observed in this area. Another transient species that may be present within the area is the Antillean manatee (*Trichechus manatus*).

Humpback whales (Megaptera novaeangliae) are known to occur in deep, offshore waters near the project area; however, the most current NOAA cetacean survey (February-March 2001) did not observe humpback whales within the project area.

Table 4: Species potentially present in project area

Common Name	Scientific Name	Status	
Loggerhead sea turtle	Caretta carretta	Threatened	
Green sea turtle	Chelonia mydas	Threatened	
Leatherback sea turtle	Dermochelys coriacea	Endangered	
Hawksbill sea turtle	Eretmochelys imbricate	Endangered	
Olive Ridley sea turtle	Lepidochelys olivacea	Threatened	
Kemp's Ridley sea turtle	Lepidochelys kempii	Endangered	
Antillean manatee	Trichechus manatus	Endangered	
Humpback whale	Megaptera novaeangliae	Endangered	
Elkhorn coral	Acropora palmata	Threatened	
Staghorn coral	Acropora cervicornis	Threatened	

Two federally threatened coral species, elkhorn coral (*Acropora palmata*) and staghorn coral (*Acropora cervicornis*) may potentially occur in coral reef areas approximately 0.6 mile southwest and one mile northeast of the project area. However, these coral species were not found during May 2004 sampling conducted by OHAI at the two adjacent reef areas.

5.10 Land Use and Aesthetics

The offshore project area is located within the open-ocean. While some vessels do pass through, the area is not located along major shipping lanes, cruise line routes, or other highly trafficked large vessel routes. Little fishery activity occurs in the area. The vast majority of diving and reef fishing activities are confined to the reef shelf, approximately 1.5 miles from the offshore project area. Most present offshore fishing activity is centered along the 100-fathom drop-off, along the southwestern edge of the shelf, approximately one nautical mile southwest of the offshore project area (OHAI 2005). The offshore project area is not located within a sensitive viewshed.

The onshore project area sits near a small cove where fisherman anchor their "yolas" (small boats). The onshore project area is bordered to the north by the Puerto de Yabucoa, to the east by a dirt road, to the south by an asphalt road and to the west by a dike and a vacant parcel of land. Vacant and active industrial properties are located near the project area (Old Union Carbide transshipment structure and dock and Shell Chemical Yabucoa Inc.) The project area is covered with herbaceous vegetation and has previously been used as a clandestine landfill (OHAI 2006a). Garbage, old cars, and other refuse have been dumped in the area. The shoreline includes areas with rip-rap, sheltered areas with solid man-made structures, and fine to medium grained sand beach. No prime or unique farmlands exist within the onshore project area. The onshore project area is not located within a sensitive viewshed.

5.11 <u>Transportation</u>

The onshore project area can be accessed via Puerto Rico Route 53. The onshore project area is bordered to the east and south by local access roads.

5.12 Cultural Resources

Cultural resources are defined as historic properties and objects and archaeological sites of national, state and local importance. The identification and evaluation of historic architectural and archeological resources was conducted in accordance with federal and state laws which protect significant cultural resources. Those laws include:

The National Historic Preservation Act (NHPA) establishes government policies and procedures for the preservation of important historic properties. Section 106 of the NHPA requires federal agencies to consider the effects of their actions on historic properties in accordance with the regulations of the Advisory Council on Historic Preservation, 36 CFR 800.
The American Indian Religious Freedom Act (AIRFA) requires that the federal government respect and protect the rights of Indian tribes to the free exercise of their traditional religions.
The Archeological and Historic Preservation Act (AHPA) requires that federal agencies report any perceived impacts that their projects and programs may have on archeological, historic, and scientific data, and to recover such data or assist the secretary of the interior in recovering them.

Consultations required by Section 106 of the NHPA were initiated with the Puerto Rico State Historic Preservation Office (SHPO) to identify known cultural resources and relevant resource concerns. According to the SHPO (2004), no cultural resources are located within or adjacent to the proposed onshore and offshore project components (*Appendix C*).

6.0 ENVIRONMENTAL CONSEQUENCES

6.1 Physical Geography, Geology and Soils

The no action alternative would not impact the physical geography or geology of the project area. The no action alternative could have a slight negative impact on soils in the onshore project area because garbage dumping at the site would likely continue in the absence of the proposed project. Unregulated dumping at the site has the potential to leach contaminates into the soil.

Any impacts due to the proposed action alternative upon the physical geography or geology of the onshore and offshore project area should be minimal. The proposed action alternative would have a slight positive impact on soils within the onshore project area because clandestine garbage dumping at the site would end.

A 6,000 square feet leveled foundation will be constructed at the onshore project area. However, the development of the operations facility should not result in a significant impact because soils in the project area are already disturbed.

6.2 Water Resources

The no action alternative would not impact surface water or groundwater resources.

The proposed action alternative would not significantly impact surface water or groundwater at the onshore project area. A freshwater well will be installed at the south side of the property to supply freshwater needs for the hatchery. Freshwater needs would be less than 5 gpm. A two-inch wide saltwater intake pipe would be installed to supply saltwater needs for the hatchery. The pipe would extend approximately 60 feet out from shore and be secured to the sea bottom by concrete anchors and nylon twine. The water would be cartridge filtered, ozonated, destructed and UV sterilized prior to use within the facility. Saltwater need will be minimal, in the order of 1 gpm, due to the recirculating system (OHAI 2005).

6.3 Water Quality

The no action alternative would not impact water quality.

The proposed action alternative has a slight potential to impact water quality in the offshore project area. The proposed action alternative would create a minor risk of pollution from spills of fuels, oil, or hydraulic fluids from boats used to deploy anchor and cages, and operate (two round trips per day) the business, but no greater than other boats that routinely operate in Puerto Rican waters. OHAI would adhere to Coast Guard regulations for cage towing and deployment operations. Nutrient discharge from the proposed action alternative would not have a substantial impact on water quality in the offshore project area. According to the Puerto Rico Water Quality Board Water Quality Certificate (2006) obtained for the project, discharges from the proposed action alternative would meet Puerto Rico water quality standards, provided that effluent limitations and monitoring requirements listed in the certificate are met (*Appendix D*).

The ocean currents provide rapid mixing and dilution of nutrients. At the Snapperfarm aquaculture project in Culebra, Puerto Rico, water quality analyses indicate that there were no statistical differences for ammonia, nitrate, nitrite and phosphate concentrations in the water or in the organic matter and organic nitrogen in the sediments, between the cage site and the control site. *Table 5* describes biological loading in the water column that would result from the

Table 5: Biological loading in water column from offshore fish farm

Organic Material Input	Year 1	Year 2	Year 3
Farm Production Harvest (Kg fish per year)	115,163	539,072	1,000,298
Feed Provided per Year (Kg)	266,317	876,815	1,355,857
Equivalent to Average Feed per Day (Kg)	730	2,402	3,715
Total Nitrogen Released per Day (Kg)	20	66	102
Total Phosphorus Released per Day (Kg)	4	12	19
Total BOD Released per Day (Kg)	255	841	1,300
Total Suspended Solids per Day (Kg)	182	601	929
Number of Sea Stations In Operation	4	8	10
Ocean Volume Dilution			
Volume water of cage lease site (500m x 500m x 34 m) m ³	8,500,000	8,500,000	8,500,000
Water Flowing through farm			
Water flow (m/day)	12,960	12,960	12,960
Volume water (m³/day)	220,320,000	220,320,000	220,320,000
Pollutant Loading per cage			
TN (mg/l)	0.00200	0.00329	0.00407
TP (mg/l)	0.00036	0.00060	0.00074
Pollutant loading within cage lease area			
TN (mg/l)	0.000091	0.000300	0.000464
TP (mg/l)	0.000017	0.000055	0.000084

EPA Performance Standards for CAAP August 2004, Aquaculture 124:293-305, 1994

proposed OHAI offshore fish farm facility.

The fish feed used in the proposed action alternative is not anticipated to cause adverse impacts to water quality in the offshore project area. Feed would be dispensed via feeding tubes anchored in the upper, central area of the cages so that food can be consumed before escaping through the bottom. Sensors would be used to gauge feeding response and detect the presence of uneaten food pellets. If uneaten food pellets are detected, feeding could be suspended. The equipment to be used allows feeding to be quickly turned on and off. These steps would greatly reduce the potential for waste feed.

Excess fish (*Table 5 shows projections*) feces would not be likely to accumulate below the cages due to the strong water currents in the area, which both disperse accumulated particles and scour the ocean floor. The Vieques Passage tidal current velocity ranges from approximately 0.6 feet/second (0.35 knot) to 1.7 feet/second (1.0 knots). The direction of the current is highly variable and its pattern is strongly modulated by the Roosevelt Roads and Maunabo tides (OHAI 2005). The speed and variable direction of the current would allow the marine ecosystem to disperse and assimilate the fish feces.

Sediment monitoring around the cages would be required as a condition of the operating permits for the facility. Weekly diving surveys to the ocean floor would be conducted (in conjunction with the regular dive maintenance program) to ground truth the actual feed management plan to the observed ocean floor results. Changes to feeding strategies and recalibration of the sensor technology would be implemented to correct for any witnessed accumulated waste feed.

Effluent water from the proposed onshore hatchery would not have a substantial impact on water quality in the onshore project area. All effluent water from the hatchery would be treated (drum filtered) before leaving the facility, including a tertiary treatment system for nutrient polishing within the settling area. The effluent would then exit the facility through a four-inch discharge pipe into the Yabucoa harbor. The process waters to be discharge from the hatchery facilities would meet or exceed the Class B Water Quality Criteria, which is the EPA's water quality standard for the area.

The discharge pipe would be buried below the beach level at the shoreline. The pipe would reemerge approximately 10 feet from the shoreline and extend approximately 100 feet into the

ORGANIC MATERIAL INPUT

harbor, following the contour of the bottom to a depth of 40 feet. The pipe would be anchored to the ocean bottom. *Table 6* describes biological loading in the water column that would result from the onshore hatchery.

Processing plant water from the proposed facility would be discharged (*Table 6* provides calculations) to the Yabucoa

Table 6: Biological loading from on-shore hatchery

ONGANIO INATERIAL INFOT	
Fingerling Feed Provided per year (Kg)	1,650
Broodstock Feed Provided per Year (Kg)	1,460
Equivalent to Average Feed per Day (Kg)	8.5
Total Nitrogen Released per Day (Kg)	0.23
Total Phosphorus Released per Day (Kg)	0.04
Total BOD Released per Day (Kg)	2.98
Total Suspended Solids per Day (Kg)	2.13

EPA Performance Standards for CAAP August 2004, Aquaculture 124:293-305, 1994

municipal sewer system. Protein and oil removal technology equipment, compliant with Pretreatment Standard for Existing Sources, would be used to treat the wastewater prior to its discharge into publicly owned treatment works.

All sludge generated from the hatchery operation would be stabilized and stored. Solids effluent (sludge) from the hatchery operation would be consolidated into a common sludge line, and pumped into a 400-gallon sludge thickening tank (thickening based on gravitation). Stabilization of the thickened sludge would be done with lime. This treatment would eliminate offensive odors and the potential for putrefaction. Stabilized sludge would then be stored in a 1000-gallon sludge storage tank. Once the sludge has been neutralized, it will be disposed of in the Humacao Landfill consistent with local permits requirements (OHAI 2006b). Effluent treatment water (approximately 500 gallons per day) will be 60 micron drum filtered, biofiltered and then ozone treated before being released into a 0.25 acre settling area. Discharge from the settling area into a municipal waste water system will occur dependent upon local and federal statutes.

Solid waste generated at the facility would include fish offal from gutting and fillet processing. When fully operational, OHAI would produce approximately 551,155 lbs per year of fish offal. Initially, OHAI would contract with a waste management company to remove the fish offal waste. In the future, OHAI intends to ensilage the waste onsite and then use it as land-based agricultural fertilizer or a terrestrial livestock feed component.

The onshore facility bathrooms would not impact water quality in the study area. OHAI would install Envirolet composting toilets at the hatchery which use evaporation and aerobic microbes to reduce and recycle waste into dry compost material, using little or no water (Envirolet 2007).

Back-up emergency power for the onshore facility would be supplied by an approximately 100 Kilowatt diesel generator. A 1000-gallon double-walled diesel fuel tank would be installed near the generator. A roofed spill-proof berm will surround the tank for spill protection. Fuels, paints, solvents and other hazardous materials would be stored within the diesel tank storage area. A 500-gallon diesel fuel tank equipped with spill protection will be used to service the dock area. Employees will receive training in the use of emergency response spill equipment, which will be present at the site (OHAI 2006a).

6.4 Wetlands

According to a field wetland identification and determination study conducted by OHAI for the on-shore components of the project, no wetlands are present (*Appendix B*). Therefore, neither the no action alternative nor the proposed action alternative would impact wetlands.

6.5 Floodplains and Coastal Zone Management

The no action alternative would not impact floodplains or resources within the coastal zone. According to the Puerto Rico Planning Board, the offshore part of the proposed project is consistent with the coastal zone management plan certification requirements in Puerto Rico

(Appendix C, PRPB 2004). The onshore portion of the proposed action alternative will be located along the coastline and within the 100-year floodplain. This part of the project is awaiting the coastal zone management determination by the Planning Board.

6.6 Air Quality and Noise

The no action alternative would not impact noise or air quality.

The air quality within the proposed action alternative project area is in attainment for all National Ambient Air Quality Standards. Temporary minimal impacts to noise and air quality may occur during construction. Truck and other vehicle traffic operating to support the hatchery operations would increase, (i.e., one 20-feet trailer truck per week, two round boat trips per day, and up to 40 employee vehicles over a 24-hour period) thereby slightly increasing noise and emissions in the immediate surrounding area (see Section 6.11, Transportation). A back-up generator would be installed at the onshore hatchery, however it would be used infrequently and housed within a sound-proof enclosure.

6.7 <u>Terrestrial Vegetation</u>

The no action alternative may continue to negatively impact vegetation in the project area because poor site conditions (e.i., erosion, invasive species, litter).

The proposed action alternative will result in the clearing of primarily non-native upland vegetation at the onshore project area. However, all palm trees would be left intact.

6.8 Aquatic Resources

6.8.1 Aquatic Invertebrate Communities

The no action alternative would not impact aquatic invertebrate communities.

The equipment used for the proposed offshore facility will not substantially impact aquatic invertebrate communities. The anchors used to secure the cages to the ocean floor would result in only minimal re-suspension of soft sediments. Impacts to biota will be minimal, and contained to the immediate footprint of the anchor block. According to OHAI invertebrate sampling, the offshore project area is not rich in benthic fauna; this would further reduce any potential impact (OHAI 2005).

Water column and benthic effects simulation modeling was conducted for the proposed project by Systems Science Applications, Inc. and the University of Southern California, with funding support from NOAA (*Appendix E*). The model was based on existing sub-models of fish physiology, hydrodynamics, and benthic effects, and was run with site-specific data. The model simulated oxygen, nitrogen, phytoplankton, and zooplankton effects as well as benthic carbon loading, distribution, re-suspension and transport.

Results of the modeling indicated that all measurable effects will be retained in the production zone. Enhancement of primary production (phytoplankton) is predicted by the model, but at

levels below measurable detection limits compared to background concentrations. Zooplankton communities would benefit proportionately but similarly; no change in stock biomass would be detectable. The oxygen deficit that originates from fish extends 98 feet beyond the cages, as has been documented at other North American facilities, including the Snapperfarm project in Puerto Rico, and projects off the coasts of Maine and Washington states (Parametrix 1990, SAR 1997, Normandeau Associates and Battelle 2003).

Flow regimes do not favor transport of nutrients from the cages toward aquatic invertebrate communities at neighboring reefs. Nutrients would be rapidly dispersed and mixed with large volumes of ocean water flowing through the site. Nutrients would not cause phytoplankton blooms or reduce light levels or water transparency at the reefs (OHAI 2006a).

6.8.2 Essential Fish Habitat

The no action alternative could have future impacts to essential fish habitat (EFH) and associated fishery species because it does not support offshore aquaculture as an alternative to destructive commercial fishing practices, such as bottom trawling. Bottom trawling involves large nets pulled along the ocean floor, which catch rocks, coral, and fish. Large metal plates drag along the ground, keeping the net close to the ocean floor and stirring up sediment. Living corals can be destroyed with a single pass of a bottom trawl, and may take decades to recover (Lazaroff 2003). Offshore aquaculture presents an opportunity to offset some of the growing global demand for seafood, with fewer impacts to EFH than bottom trawling and other commercial fishing practices.

According to consultation with the NMFS and the U.S. Army Corps of Engineers (COE), the proposed action alternative would comply with the Magnuson-Stevens Fishery Conservation and Management Act by not impacting EFH or associated fishery species (Appendix C, NMFS 2006 and COE 2006). Open-ocean cage systems have substantially less potential to degrade water quality/habitat conditions than traditional aquaculture because strong currents flowing into deeper waters quickly dilute wastes. As part of the project, a detailed water quality monitoring plan will be implemented to determine whether the cage installation and operation result in adverse impacts to EFH and fishery species over time. If adverse impacts are detected, Section 7 consultation will need to be reinitiated (Appendix C, NMFS 2006).

6.8.3 Wild Fish Stocks

The no action alternative could have a negative future impact on wild fish stocks because it does not support offshore aquaculture as an alternative to destructive commercial fishing practices. Commercial fishing practices, such as longlining, gillnetting, and bottom trawling, cannot discriminate between target catch and other animals that are undersized or unmarketable. These practices are damaging to the population and age distribution of wild fish stocks and their food sources. Offshore aquaculture presents an opportunity to offset some of the growing global demand for seafood, with fewer potential impacts to wild fish stocks.

The proposed action alternative is not anticipated to have a genetic impact on wild cobia stocks.

The SeaStation nets to be used for the project have been tested extensively in other aquaculture operations (e.g., Cates International, Inc. and Kona Blue Water Farms in Hawaii, Snapperfarm in Puerto Rico, and the University of New Hampshire demonstration project), and have been found to be highly resistant to predation (which could result in the escape of cultured fish). In 2005, Ocean Spar Technologies had 35 SeaStation cages in use worldwide, including 12 in the United States. As of 2005, SeaStation nets were used in all of the offshore aquaculture projects operating in U.S. waters (Barnaby 2006).

Even if significant numbers of cobia did escape, the cultured cobia stocks are within the same genetic management unit as wild stocks (*Appendix C, NOAA 2006*). No phenotypic or other selection processes would be used to select the cultured cobia. Therefore, interbreeding would not cause a reduction in fitness of resulting progeny or other adverse genetic effects. Further, catches or sightings of wild cobia are very rare in Puerto Rico waters (Alston et al. 2005).

The proposed action alternative would not have a genetic impact on other wild fish stocks, or reduce the abundance of wild fish stocks through resource competition. Interbreeding with other species would not occur due to normal interspecies differences. The establishment of a local population solely from escaped fish (that might compete with other fish stocks for resources) is highly unlikely. Nowhere throughout the world does cobia exist in large numbers (Kaiser and Holt 2005). In the event that a large number of cobia escape, and a local population is established, this population would trend toward a lower, naturally occurring population size. This is due to the same ecosystem pressures that control naturally-occurring cobia (e.g., predation, food availability).

The proposed action alternative has the potential to impact the level of disease in wild fish stocks. Cultured fish are susceptible to fish disease when grown in poor conditions or handled improperly. Stressed and dead diseased cultured fish stocks could spread fish-borne aggregation pathogens to native fish populations. However, a literature review conducted for this project found no documented and accepted cases of disease epizootics in wild marine fish being caused by marine netpen fish culture (Arijo 2005, Brooks 2004 and 2005, Chen 2001, Faulk 2005, Lee 2003, Liao 2004, Liu 2004, Ogawa 1996, Olfasen 2001, Rajan 2003, Seng 1997, Sepulveda 2004, Toranzo 2005, Tung 2000, Waknitz 2003, Wedemeyer 1996).

The literature shows that wild stocks that have been studied generally have much higher rates of chronic infections and parasite loads than farmed fish (Kent 1994, Meyers and Winton 1995, Amos 1998, Deardorf and Kent 1999, McVicar 1997, Amos et al. 2001a, and Amos et al. 2001b). Many authorities in the field believe that farmed fish are more at risk from contracting diseases from wild fish than vice versa, at least in the U.S. and other countries where advanced fish culture and fish health practices are followed and required.

A recent NOAA risk assessment for net pen aquaculture concluded that infection of wild stocks from net pen fish was a low risk for several reasons (Nash 2003, based on Nash 2001). Specific diseases and their prevalence in cultured stock in net pens in the U.S. were not shown to be

different from those in wild fishes of the same genus. Moreover, fish cultured in net pens were subject to routine inspection for bacterial or viral diseases and permitting jurisdictions usually do not allow movement of fish from place to place without formal permit. Fish disease in U.S. commercial net pens is currently much less common than before the use of effective, polyvalent (multiple pathogen) vaccines.

At aquaculture operations in Hawaii and at Snapperfarm in Puerto Rico, only two wild cobia were ever sighted on a single occasion near the submerged pens (Alston et al. 2005). Although Puerto Rico is within cobia's native range, few wild cobia are ever caught or observed. This greatly limits the possibility of disease transfer to wild cobia stocks.

Studies have shown that overlapping generations of fishes provide a "pool of pathogens" for newly placed juveniles susceptible to disease due to age and transport related stress (Leong 1997). Single year segregation would control disease outbreak and spread.

6.8.4 Pharmaceuticals

The use of pharmaceuticals in the aquaculture production process is not anticipated to impact aquatic resources within the offshore project area or in the vicinity of the onshore hatchery discharge pipe. OHAI would comply with U.S. Department of Agriculture (USDA) regulations regarding the use of pharmaceutical compounds.

Antibiotic persistence in sediments and invertebrates beneath fish farms has been investigated, but in no cases were judged to be persistent at environmental levels dangerous to humans or aquatic fauna (e.g., Weston et al. 1994, Sowles 2003, Jacobsen and Berglind 1988). These authors drew their conclusions for the cold waters of Puget Sound; breakdown rates in the warm waters of Puerto Rico should greatly expedite degradation.

In 1995, the Center for Veterinary Medicine completed an EA on the use of formalin in all species of finfish (including species' eggs). The EA concluded that the use of formalin would not have a significant impact on the environment provided the product was used according to labeling instructions (Western Chemical 2006).

Antibiotic use has plummeted in modern aquaculture. Many fish farms in North America and Europe operate for multiple years without using any antibiotics at all (EAO 1997, OATA 2002). Antibiotic use at the proposed facility would be a last-resort option. Pharmaceuticals that could be used include:

Romet 30, Terramycin, Aquaflor (antibiotics dispensed in feed)
Oxytetracycline (antibiotic for experimental marking of otoliths, a bone-like structure found in the inner ear of many fish species that allows scientists to estimate age)
MS-222 (naturally occurring compound used as anesthetizing agent)
Chorulon (purified gonadotrophin used to induce/synchronize ovulation and spawning)
Formalin (used to treat eggs and fish for parasites and fungal infections)

None of these compounds are persistent in the environment or bioaccumulate in the target fish or other flora and fauna (Weston, et al. 1994, Francis-Floyd 1996). Filtration and bioremediation planned for the hatchery recirculation system would allow time for the compounds to degrade into innocuous byproducts (e.g., formalin degrades into carbon dioxide and water).

6.9 Endangered, Threatened and other Protected Species

The no action alternative might continue impacting threatened or endangered species because it does not support offshore aquaculture as an alternative to destructive commercial fishing practices. Commercial fishing gear used in longlining, gillnetting and bottom trawling can ensnare threatened and endangered species, including sea turtle species known to occur in the waters of Puerto Rico (Lazaroff 2003). Offshore aquaculture presents an opportunity to offset some of the growing global demand for seafood, without the danger to threatened or endangered species.

Based on the results of Section 7 consultation with the NMFS and USFWS, the proposed action alternative is not likely to significantly impact threatened or endangered species (*Appendix C*, *NMFS 2006 and USFWS 2005*). The onshore and offshore project areas are not located in critical habitat for any threatened or endangered species.

There is a slight potential that transient species, including several species of sea turtle and the humpback whale, could pass through the offshore project area. However, entanglements with sea turtles or whales are unlikely because the cage netting would be kept tightly stretched, and there would be no floats, buoys or loose trailing lines that might entangle sea turtles or whales. To date, there have been no documented entanglements of sea turtles or whales with this type of cage in previous studies, including a similar aquaculture project (Snapperfarm) in Culebra, Puerto Rico (Appendix C, NMFS 2006).

The nearest coral reefs to the offshore study area are approximately 0.6 mile southwest and one mile northeast. Environmental monitoring data from the Snapperfarm demonstration project in Culebra, Puerto Rico indicated that the benthic effect area from offshore aquaculture extends approximately one-quarter mile from the cages. Therefore, although elkhorn coral (*Acropora palmata*) and staghorn coral (*Acropora cervicornis*) could possibly be present at the reefs, they are unlikely to be adversely impacted. In addition, the prevailing currents in the area do not move toward the coral reefs, furthering lessening the likelihood of impact (*Appendix C, NMFS 2006*).

6.10 Land Use and Aesthetics

The no action alternative or current land use would continue the negative environmental and/or aesthetic impact in the project area.

The proposed action alternative would convert approximately 2 acres of vacant light industrial property owned by the Puerto Rico Ports Authority into a fish hatchery and operation base for the aquaculture facility. The operation base would include loading of feed and off loading of

harvested fish, an operations office, and vessel dockage.

The proposed action alternative would not significantly impact aesthetics in the onshore or offshore project areas. Neither project areas are located in sensitive viewsheds. Additionally, the site is currently used as a clandestine landfill, and adjacent industrial uses are part of the aesthetic setting. The cages associated with the offshore facility will be submerged, and should therefore have minimal visual impact.

6.11 Transportation

The no action alternative would not impact transportation in the project area.

The proposed action alternative will add one or two trips by 20-foot long trailer trucks per week to local roads. In addition, the facility will employ approximately 40 employees over a 24-hour period. A parking lot, sufficient for 28 cars, will be constructed at the onshore project area. Two boat trips per day would be required to operate the facility (OHAI 2006a).

6.12 Environmental Justice

Consisting with Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," EPA performs environmental justice assessments on areas potentially affected by proposed projects. Areas that meet EPA criteria classifying populations as an Environmental Justice (EJ) area undergo a full EJ analysis. The focus of this EJ analysis was the residential populations in direct proximity to the onshore location of the project. The municipalities of Yabucoa and Humacao were chosen as the Community of Concern (COC) for this analysis. The goal of this analysis was to identify whether the proposed project would create any disproportionate negative impacts to the COC's environmental and human health.

Step 1: Demographic composition of the COC was investigated using geographic information system (GIS) analysis. The GIS demographic analysis uses the COC and a significant reference community to compare demographics. Puerto Rico was used as the reference community. The analysis identified 54.8% of the Yabucoa population as being low-income in comparison to 45.2% for Puerto Rico. The Humacao population had a low-income composition of 46.1% in comparison to 45.2% for Puerto Rico. Being above the reference community figures, the COC percentages of low income population triggered EPA's criterion and moved the analysis to step 2 (full EJ analysis).

Step 2: Environmental burden of the COC was investigated using GIS analysis. Indicators were developed and used to compare the environmental burden of the COC to that of Puerto Rico. EPA Region 2 uses the concept of an Environmental Load Profile (ELP). The ELP helps to identify COCs that may bear a disproportionate environmental load in comparison to statewide-derived thresholds. Currently the ELP consists of three indicators: Toxics Release Inventory

(TRI), Air Emissions, Air Toxics and Facility Density. ELP results indicated that the Facility Density indicator for both COCs and the Air Toxics indicator for Humacao are above the thresholds.

Step 3: Next, the contribution of the proposed project to the ELP was considered. This project would fall into the category of small quantity generator, and small quantity generators are not included in the calculation of the Facility Density Indicator. Therefore, the proposed project will not contribute to the Facility Density Indicator nor will it contribute to the other ELP indicators.

In conclusion, based on the EJ analysis (*Appendix G*), and the fact that the proposed project is designed to operate such that it should not impose further negative environmental or health impacts to the COCs, the project does not appear to present any disproportionately high and adverse impacts to the COCs. For additional information regarding environmental justice, visit the EPA website at: http://www.epa.gov/region02/ej/, for additional information on the methodology and indicators used in the assessment, visit the EPA website: http://www.epa.gov/region2/ej/poltoc.htm

6.13 Cultural Resources

According to the SHPO, no cultural resources are present (*Appendix C, SHPO 2004*). Therefore, the no action alternative and proposed action alternative should not impact cultural resources.

6.14 Secondary and Cumulative Impacts

Secondary/indirect impacts are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8b)."

Cumulative impacts are "impacts on the environment, which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7)."

Offshore Study Area

The geographic area used to discuss cumulative effects for the offshore portion of the proposed project includes the 62-acre site and approximately 0.62 mile (one kilometer) in each direction surrounding the site. The cumulative effects area was determined based on the System Science Applications water column and benthic effects simulation modeling.

No other past, present or foreseeable future actions were identified as contributing to cumulative effects in the offshore study area. NPDES discharges in the region are concentrated in nearshore areas. The Vieques Passage tidal current generally parallels the shoreline both nearshore and offshore. Therefore, the discharge from the proposed project and distant NPDES permit holders are not likely to be combined by ocean currents. None of the current NPDES permit holders in the region discharge within or near the cumulative effects area. The only other offshore aquaculture farm on the east coast of Puerto Rico, Snapperfarm, is located approximately 33.5 miles from the proposed project.

A cumulative effects analysis of water quality and aquatic resources for the offshore study area was conducted in 2006 by OHAI, in conjunction with Systems Science Applications, Inc. and the University of Southern California, with funding support from NOAA. Water column and benthic effects simulation modeling was performed in support of the analysis (*Appendix E*). The no action alternative will not result in secondary or cumulative effects to water quality or aquatic resources at the offshore study area.

The offshore portion of the proposed project would not significantly contribute to a cumulative effect on water quality or aquatic resources. The proposed open-ocean cages would discharge dissolved nitrogen and organic, particulate carbon-containing solids. This discharge would be biologically assimilated into offshore waters. Modeling results predicted that oxygen deficit effects would be limited to within 98 feet of the cages, and benthic effects would be limited to within one-quarter mile of the cages.

Onshore Study Area

Yabucoa Bay was selected as the cumulative effects area for the land-based portion of the proposed project because treated effluent water from the land-based facility would be discharged into the bay. The water quality of the bay is considerably impaired due to the numerous point source and non-point source discharges (OHAI 2005). In 2001, Shell Chemical Yabucoa Inc. (SCY) studies documented an extensive turbidity plume discharging from the Guayanes River into Yabucoa Bay and covering a majority of the bay. Pollutants, sewage, organic matter and solid waste also enter the bay from upstream and coastal communities and beach activities along the coast (SCY 2006a). Numerous point source outfalls exist in the bay, including the City of Humacao wastewater treatment plant and the SCY Oil Refinery.

Future actions in the Yabucoa Bay area include maintenance dredging in the Yabucoa Harbor. The harbor was designed to support oil tankers carrying liquid bulk petroleum and petrochemical products. The harbor contains a 500-to-700-feet wide, 50-feet deep entrance channel, with a 1000-feet diameter turning basin. The Puerto Rico Ports Authority, with technical support from the COE, plans to maintenance dredge the harbor's berthing areas, turning basin, and entrance channel.

The construction of a sanitary sewer system for the municipality of Yabucoa, financed by the USDA Rural Development Program, is also planned for the Yabucoa Bay area. The sewer

system will serve approximately 260 families and 7 small businesses potentially including OHA project site (USDA 2006).

The no action alternative will not result in secondary or cumulative effects to water quality or aquatic resources at the onshore study area.

The onshore portion of the proposed project would not significantly contribute to a cumulative effect on water quality or aquatic resources. Effluent water from the hatchery would be treated and then exit the facility through a four-inch discharge pipe into the Yabucoa harbor. The hatchery would use a recirculating system to minimize the amount of treated effluent water released into the bay. The discharge would meet or exceed the Class B (EPA's Water Quality Standards for Coastal Waters of Puerto Rico) Water Quality Criteria. Therefore, the small amount of treated effluent water from the proposed onshore facility is not significant enough to cause or contribute to an adverse cumulative impact to water quality or aquatic resources, including fish and aquatic invertebrates, in the Yabucoa Bay.

As a NPDES permit condition, SCY conducts benthic sampling and toxicity testing in the interim mixing zone. Testing results demonstrate that SCY's interim mixing zone (extent of the effluent plume) is located approximately 3280 feet from the mouth of Yabucoa Harbor (SCY 2006a, SCY 2006b, SCY 2006c). Therefore, the effluent from the proposed project's discharge pipe (located inside the harbor approximately 100 feet from shore) will not mix with SCY effluent.

7.0 MITIGATION MEASURES

A five-year Environmental Monitoring Plan (EMP) (*Appendix H*) will be implemented as a permit condition to evaluate water quality and biological variables at the offshore project area, the proposed fallowing area, and the two nearest reefs to the offshore project area. A preliminary study to provide baseline data was conducted during May 2004. The EMP will include monthly monitoring of: dissolved oxygen, salinity, water temperature, water transparency, and turbidity. Levels of chlorophyll-a, nitrite, nitrate, ammonia, and total phosphorous would be monitored on a quarterly basis. Census and qualitative assessments of coral, sponges, macroalgae and macroinvertebrates will also be conducted every four months. The sediments composition directly below the cages will be analyzed every four months to detect absolute and relative changes, both spatial and temporal, in the presence of benthic macroinvertebrates.

A report summarizing the EMP will be sent to the COE and EPA every four months during the first year, every six months during the second and third years, and yearly during the fourth and fifth years of the five-year monitoring period. If during the five years the EMP indicates that the project is having an adverse impact on the aquatic environment, one or more of the following mitigation measures will be implemented:

Incremental reduction of the facility's standing crop biomass and expected production level
Deployment of larger mesh sizes for the cages
Use of vacuum-based instead of jet-spray cleaning net scrubbers

Development of the fallowing plan.

OHAI has designated a "fallowing area" to be used if the EMP indicates that the project is causing adverse impacts to the aquatic environment. The fallowing area is a 4.5 mile long and 0.75 mile wide corridor extending to the northeast of the offshore project area. The fallowing plan would consist of alternating the cage locations from the project area to the fallowing area to allow conditions within the project area to recover.

As a permit condition, the COE would require staging the development of the ten proposed cages. During the first year of operations, a cage would be deployed every three months, for a total of four cages by the end of the first year. The authorization to deploy the remaining six cages would depend on the results of the EMP. If warranted by the results of the EMP, OHAI would be authorized to deploy a cage every two months.

To prevent biofouling of the cages, a net cleaning/maintenance program would be implemented. This program would include nearly daily monitoring/inspection of the cages. The cages would be cleaned periodically depending on the rate of biolfouling. The cages would not be allowed to exceed levels resulting in less than 75% of the net's surface area to be clean and without organism growth. Utilization of larger cage net mesh size (~75mm mesh opening) will reduce net fouling and the subsequent total solids released to the marine environment from cleaning the nets.

OHAI would implement the following practices in order to mitigate the presence, level, and transmission of pathological agents and the possible spread to native fish populations (Tucker, et al. 2004):

All farmed fish will be hatchery reared and not from wild caught stock. Broodstock parents originate from the Caribbean. Broodstock in hatchery will be rotated to maintain genetic diversity.
Initial fingerlings delivered from Aquaculture Center of the Florida Keys will be inspected prior to sending and again upon arrival. Inspections will be carried out by USDA-certified veterinarians.
Hatchery husbandry techniques will include: the use of probiotics, available inoculations, appropriate stocking densities, sanitation and disease prevention methods, optimal diet (live and inert feed) and feeding regimes, and possibly integrated mariculture.
Prior to transfer of fingerlings from the hatchery to the grow out cages, fish will be thoroughly inspected for any pathological agents to prevent disease transference between the production stages and possibly to wild fish.
During grow out, moribund or dead fish will be collected regularly and inspected for signs of disease.
Monitoring of broodstock for general health and disease infection will also be conducted to reduce the possibility of horizontal transmission.
In the case of a disease outbreak, OHAI will respond quickly to minimize fish loss and notify EPA and appropriate authorities. Diagnostic equipment will be available on site, and samples

	will be	sent to a qualified veterinarian or fish pathologist laboratory for inspection and diagnosis.				
	such as	ings will be vaccinated for various microbiological diseases. Alternatively, antibiotics Oxytetracycline (terramycin) and sulfadimethoxine plus ormetoprim (Romet-30) could inistered though feed, although this would be a last resort.				
	sanitiza	y management and handling techniques will include the removal of mortalities, regular tion of all equipment, regular cleaning and maintenance of all cage equipment to increase t water flow, maintain high dissolved oxygen conditions and remove wastes.				
	effluen	ed, a vacuum would be attached to the net scrubber equipment to minimize impact. The t water and organic solids would be put through a drum filter to extract solids generated et cleaning.				
		te the following measures to avoid, minimize and/or mitigate any potential impacts by at the onshore study area:				
	Envirol	et composting toilets will be installed at the hatchery facility.				
	A roofe	ed spill-proof berm will surround the diesel fuel tank for spill protection.				
	Existin	and oil removal technology equipment, compliant with Pretreatment Standard for g Sources, will be used to treat processing plant water before disposing the water into the pal sewer system.				
	system	t water from the hatchery will be treated (drum-filtered), including a tertiary treatment for nutrient polishing. The effluent water would meet or exceed EPA's Class B Water Criteria before being discharged into Yabucoa Harbor.				
Rico D of info	notices epartmermal an	regarding the project were published by the Puerto Rico Planning Board, Puerto ent of Natural Resources, and Puerto Rico Environmental Quality Board. A series d formal meetings were held to discuss the proposed project with local and als (OHAI 2006b).				
	8.1	Applicant Coordination				
	opportu Puerto	sion regarding involvement of local fisherman associations and potential employment unities and nutrient loading concerns; Dr. Walter Padilla, Director Puerto Rico Fisheries, Rico Department of Agriculture; January 21, 2004.				
	Discus	sion of potential environmental impacts of offshore aquaculture and hatchery				
	operation and potential employment opportunities for local citizens; Mr. Angel Garcia					
	Mayor	of Yabucoa; February 25, 2004.				
	Further	r discussion on potential environmental impacts and local employment				
	opport	unities; Mr. Angel Garcia, Mayor of Yabucoa; June 8, 2004.				
	Discussion of potential environmental impacts of offshore aquaculture and hatchery					
	operati	ons and potential employment opportunities for members of association; Dr. Luis				

Martin, President de la Association de Pescadores en Palmas Del Mar; May 21, 2004.
Further discussion on potential environmental impacts and local employment
opportunities. Mayor Garcia offered to rent municipal property to Ocean Harvest
Aquaculture Inc. for processing operations. Mr. Angel Garcia, Mayor of Yabucoa; July 13,
2004.
Further discussion on potential employment opportunities associated with project.
Additional discussion concerning the availability for leasing of municipal property; Mr.
Angel Garcia, Mayor of Yabucoa; November 12, 2004.
Discussion focusing on development of aquaculture industry in Puerto Rico. Discussed
potential environmental impacts of offshore aquaculture and hatchery operation and
potential employment opportunities for local citizens; Honorable Luis G. Fortuna, Puerto
Rico Resident Commissioner, Washington D.C.; August 15, 2005.
Discussion focusing on development of aquaculture industry in Puerto Rico. Discussed
potential environmental impacts of offshore aquaculture and hatchery operation and
potential employment opportunities for local citizens; Mr. Eduardo Batia, Director of
Federal Affairs for Puerto Rico, Washington D.C.; August 15, 2005.

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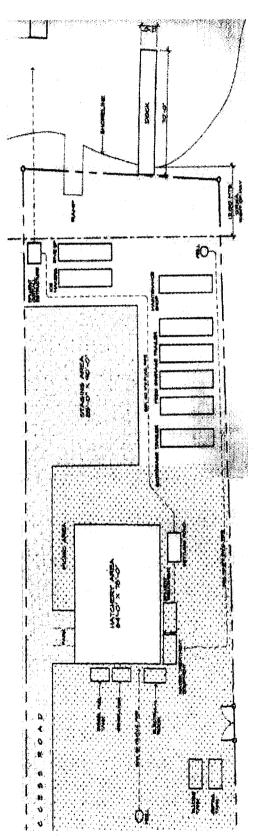
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Appendix A: Hatchery site layout plan

Appendix A: Hatchery site layout plan



Appendix B: Jurisdictional wetlands determination study

Appendix B: Jurisdictional wetlands determination study

JURISDICTIONAL WETLANDS DETERMINATION STUDY

PARCEL OF LAND OF APPROXIMATELY 2 ACRES AT PORT OF YABUCOA, YABUCOA

Prepared for:
Ocean Harvest Aquaculture, Inc.

Prepared by: Coll Rivera Environmental

October 2004

On Separation 30 2008, a site visit was performed to determine the presence of wetlands under the jurisdiction of the United States Army Corps of Engineers within a parcel of land of approximately 2 acres at the Port of Yabucoa, Yabucoa, Puerto Rico. Figure 1 shows the location of this parcel. Among the purposes of this visit was to:

- . Know the location of the study area,
- Make a visual inspection of the study area,
- Identify the presence of wetlands, and
- Determine if the U.S. Army Corps of Engineers (USACE) has jurisdiction over wetlands if they exist within the study area.

SITE DESCRIPTION

The parcel of land where this study was performed is located to the south of the Puerto de Yabucoa (see Figure 1). It is in front of a small cove where fishermen anchor their "yolas" (see Photographic Documentation). The site is bordered to the north by the Puerto de Yabucoa, to the east by a dirt road, to the south by an asphalted road and to the west by dike and a parcel of land, which has no actual use.

The study site is completely covered by herbaceous vegetation. According to the Punta Guayane's Topographic Quadrangle, topographic contours within the site range from 1 to 2 meter amsl (above mean sea level). Earth movements in the past have changed the topography, promoting the formation of depressions.

The study site is been used as a clandestine landfill. Garbage, refuse old cars and other types of materials has been dumped within the study limit.

RESULTS

As mentioned in the previous section, the study site is completely covered by vegetation. Dominant vegetation includes exotic upland species, which rapidly invade areas where existing vegetation has been recently removed for anthropogenic purposes. Table 1 shows the dominant vegetation within the study limit.

Table 1 Dominant plant species within the study limit

Scientific Name	Common Name	Stratum	Indicador
Leucaena leucocephala	Tamarindillo	Tree	Facultative
Acacia farnesiana		Tree	Upland
Pithecelobium dulce	Guamá americano	Tree	Upland
Panicum maximum	Hierba de guinea	Herb	Facultative-

The only species associated to wetlands is the Leucaena leucocephala, which is a facultative one. This means this species could be found from 33 to 66 percent of the time in wetlands. However, the most dominant species within the study limit was Panicum maximum. The occurrence of L. leucocephala is mostly related to the aggressive and invasive nature of it. Nevertheless, P. maximum is a species which could be dominating the study limit more permanently.

Soils within the study limit are sandy, but filling material, including garbage was found at the place. This parcel of land has been impacted by activities such as cleaning and maintenance of dirt roads that are to the east, mechanized accumulation of sand and filling material from other places and the current dumping of garbage.

Hydric soil indicators were found in two sampling points, which exhibit a depressional landform. These included organic layers and mottles. Soil saturation was the wetland hydrology indicator present in these two sampling points. However, it is important to mention that the field visit was performed during a rainy period.

CONCLUSIONS AND RECCOMENDATIONS

The study area has been impacted for anthropogenic purposes many times. Although hydric soil indicators, as well as wetland hydrology indicators were found in two sampling points, the dominant vegetation, which is *Panicum maximum*, is not considered to be a wetland species. The rest of the vegetation is mostly found also in upland areas.

The depressions within the study site were created by the mechanized movement of soil and deposition of filling material. These depressions do not show a hydrological

superficial connection to any U.S. Water, though are relatively close to the Puerto de Yabucoa. But again, the vegetation criterion to be a jurisdictional wetland is not met.

For these reasons we conclude that the study site does not possess wetlands under the jurisdiction of the USACE. However, the USACE has the final determination in this regard.

Appendix C: Agency Correspondence



DEPARTMENT OF THE ARMY

JACKSONVILLE DISTRICT COAPS OF ENGINEERS
ANTILLES OFFICE
400 FERNANDEZ JUNCOS AVENUE
SAN JUAN, PUERTO RICO 00901-3299

APR 22 2004

Antilles Regulatory Section SAJ-2004-577 (IP-JCM)

Mr. David B. Frasier Ocean Harvest Aquaculture, Inc. # 8 Surfside, Palmas del Mar Humacao, Puerto Rico 00791

Dear Mr. Frasier:

Reference is made to the Department of the Army (DA) permit application, submitted by you through Joint Permit Application (JPA) number 536, for the proposed installation of ten finfish aquaculture "Ocean Spar" cages within waters of the Caribbean Sea. More specifically, the cages would occupy a 54 acre site located two miles off shore, at a bearing of 150 degrees, from Palmas del Mar Marina, Humacao, Puerto Rico. The cages would be diamond shaped, with dimensions of approximately 49 feet (15 m) tall and 82 feet (25 m) in diameter. Please refer to case number SAJ-2004-577 (IP-JCM), in future correspondence regarding this proposal.

Attached is a list of the letters received in response to the Public Notice issued for the above referenced application. Copies of the response letters are also enclosed. The following paragraphs summarize the comments provided in those letters. Please review and provide a <u>detailed</u> written response to each of the issues raised in these letters.

The State Historic Preservation Office (SHPO), by letter dated March 3, 2004, stated that their records indicate that no historic properties are located within the project's area of potential effects.

The Puerto Rico Ports Authority, by letter dated March 30, 2004, expressed that since according to the information provided in the Public Notice the proposed works would be located out of the Port of Yabucoa's entrance range, they have no objections to the approval of a permit for this project.

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Habitat Conservation Division (NOAA Fisheries HCD), by letter dated April 5, 2004, recommended that no permit be issued for the project, until information necessary to ensure that the project would not adversely affect the conservation of Essential Fish Habitat (EFH) and associated fish resources is provided and evaluated. In this regard, NOAA Fisheries HCD recommended that, since the general project location (Punta Guayanés) is surrounded by coral reefs, a benthic survey of the project area should be

conducted to determine whether the installation of the cages would have direct impacts on EFH and develop project designs to avoid or minimize these impacts. According to NOAA Fisheries HCD, studies should also be conducted to determine whether the introduction of high nutrient loads, in the form of food, to the project area would have an impact on neighboring coral communities, such as nutrient loading and increased turbidity, followed by decreases in light penetration. NOAA Fisheries HCD also indicated that detailed information should be provided regarding the fingerling hatchery that would supply the proposed project, including the source of the fish stock, the location, and the proposed project design and operation, to determine its impacts on the habitat of native fish populations. NOAA Fisheries HCD stated that existing fish population data indicates that the fish species proposed for culture (Cobia and Florida pompano) are uncommon to rare in the Caribbean; thus, an evaluation of the abundance of these species in Puerto Rico must be conducted and provided to determine the potential impacts to local reef and fish populations in the project area due to accidental escapes from the cages. In addition, NOAA Fisheries HCD recommended that details regarding the processing of harvest from the cages should be provided. In particular, the means of transport and disposal of fish waste, and the location and design of the processing operations should be detailed to ensure that the proposed project would not contribute to the cumulative impacts of nutrient discharges on the marine environment.

The Environmental Protection Agency (EPA), by electronic mail dated April 9, 2004, requested information on the expected annual aquatic animal production (in pounds per year) by the proposed project. EPA indicated that if the expected production volume is greater than 100,000 pounds per year, the applicant would need to obtain a permit under the National Pollutant Discharge Elimination System (NPDES) program.

The U.S. Fish and Wildlife Service (FWS), by letter dated April 14, 2004, recommended that a permit for this project should be issued until several concerns are adequately addressed. FWS is concerned that although the project proposed cages would be located over sandy bottom, they would be close to several coral reef communities. Thus, the impacts to nearby coral reefs from the high nutrient loads that can be generated from the cages needs to be evaluated. FWS recommended that a year round current study should be conducted to determine whether there are seasonal shifts in near shore currents that would transport excess nutrients to the nearby coral colonies. FWS is also concerned by the fact that neither of the fish species (Cobia and Florida pompano) that would populate the cages is common in the Caribbean. FWS also recommended that the location and details of the hatchery and harvest processing facilities should be provided. Since they are all dependant on each other, any potential impacts of these facilities and the proposed cages on coastal habitats or wetlands should be evaluated as part of a single and entire project. Finally, FWS stated that they

concur, with the determination made by the Corps in the project's public notice, that the project is not likely to adversely affect threatened or endangered species.

The National Marine Fisheries Service, Protected Resources Division (NOAA Fisheries PRD), by letter dated April 15, 2004, concluded that in order for them to determine whether the proposed action may affect any listed species under their purview, they require submittal of the following information: a) duration and time period/season of construction, along with the equipment and the methodology that would be used; b) project measures to minimize potential adverse effects to listed species; c) evaluation whether any anticipated adverse impacts to NOAA Fisheries listed species are expected, and discussion of why impacts are expected or not; d) evaluation of potential interactions and/or adverse effect of the proposed project with marine mammals and turtles, such as direct/indirect effects to protected species-critical habitat, construction standards to minimize entanglements, use of deterrent technology, and water quality concerns.

After reviewing the responses stated above, the U.S. Army Corps of Engineers (Corps) agrees with the resource agencies comments. A rebuttal on the above information must be provided for us to complete our regulatory review of the proposed project. Any other information you feel may be helpful in order to fully justify the proposal should also be submitted at this time.

Pursuant to 33 CFR Part 320.4, the Corps must evaluate the project to ensure that it would not be contrary to the public interest. We are concerned about the potential direct, indirect, and cumulative impacts of the project on the aquatic resources. In that regard, please provide the following information:

- a. Perform and provide a benthic survey of the communities present at the proposed project site and down-drift to the site. Be aware that the drift changes according to the ebb and flow of the tides over the insular shelf.
- b. Provide a report showing the different current patterns in the area, including seasonal changes to have an idea of possible reach of nutrient loads, if any.
- c. Provide a site alternative analysis showing your rationale to choose the proposed project location. You shall include information regarding seasonal currents flow that could transport nutrients to nearby benthic communities.
- d. List measures taken to avoid and minimize impacts of the proposed structures to benthic communities. This may include changes in the spacing of the cages, in the location of the cages, or reduction of number of cages to be installed.

- e. Provide an evaluation of the abundance, distribution and habitat preference in Puerto Rico of the fish species proposed for culture, and discuss the potential impacts to local reef and fish populations due to accidental escapes from the cages.
- f. Provide information regarding the amount of food necessary to sustain the proposed fish culture. The information should enable us to determine if the input of nutrients would affect nearby benthic communities. Describe any measures to be implemented to control eutrophication of the surrounding waters. Please note that EPA rules certain feeding methods through the NPDES permit process pursuant to 40 CFR 122.25. Please indicate if you have submitted an application to EPA in that regard? If so, indicate what is the status of your application?
- g. Provide information regarding the expected annual yield (in pounds of fish per year) of the proposed project. EPA has indicated that if the expected production volume is greater than 100,000 pounds of fish per year, you would need to obtain a permit under the National Pollutant Discharge Elimination System (NPDES) program. Please indicate if you have submitted an application to EPA in that regard? If so, indicate what is the status of your application?
- h. Provide more specific information regarding the proposed harvest processing. Specify the proposed location for the processing facilities. Describe the processing of the harvest, including final destination. Describe the shore support facilities necessary for the process. Describe method of disposal of any remnants of the processing. Describe potential impacts to the marine environment that could result from the process.
- i. Provide information regarding potential impacts to water quality, including increase in concentrations of nutrients or other pollutants, as result of the proposed project. Specify the measures that would be implemented to minimize such impacts.
- j. Provide a long-term monitoring plan for benthic habitat and water quality. The monitoring period should be at least 5 years. The plan should include regular water quality sampling between the project site and nearby reefs. It should also include characterization of the soft substrate biota in the vicinity of the project and some permanent sampling stations on the nearby reef. The permanent sampling stations should provide data to evaluate and compare the development of hard corals vs. sponges vs. fleshy algal growth.
- k. Review the guidelines attached to the NOAA Fisheries, Protected Resources Division letter, "Recommendations for the Content of Biological Assessments and Biological Evaluations". Provide information to respond to items 2-6.

- I. Provide information regarding impacts of the proposed project to the local and regional economy. Estimate potential beneficial or detrimental effects to local fishermen, and the commercial fishery activity.
- m. Please describe which measures would be established to avoid any substantial impairment of navigational and anchorage interests. Please indicate which measures would be established to prevent interference with the general public's right of use of navigable waters of the U.S. Describe measures that would be implemented to ensure that the proposed cages would not result in a hazard to navigation, at all times.
- n. Explain who would be responsible in case that the installed structures cause an accident, or damages to others. You need to demonstrate that you have the financial capability to assume damages caused by the structures. Do you have insurance for the proposed work?
- Please explain the contingency measures that would be implemented in case of hurricanes.
- p. Describe the proposed project in the context of food production. Would the product supply the fish local demand? Would it be exported? Please compare these two proportionally.
- q. We need to know if the proposed structures would be temporary or permanent. Specify for how long the cages would be in operation. Explain what you propose to do with the cages once they need replacement or once the operation ceases.
- r. Provide information regarding the maintenance work that the structures would need to remain operational.
 - s. Please provide a brief discussion of the following:
 - (1) The relative extent of the public and private need for the proposed work.
 - (2) The practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed work.
 - (3) The extent and permanence of the beneficial and/or detrimental effects which the proposed work is likely to have on the public and private uses to which the area is suited.

You are reminded that two necessary prerequisites to the issuance of a Department of the Army permit for your project are the issuance Water Quality Certification by the Environmental Quality Board and; a Certification of Consistency with the Puerto Rico Coastal Zone Management Plan by the Puerto Rico Planning Board. Therefore, keep this office informed of the status of your applications for these certifications.

A rebuttal on the above information must be provided for us to complete our regulatory review of the proposed project. Any other information you feel may be helpful in order to fully justify the proposal should also be submitted at this time.

Your application will be held in abeyance for 30 days pending receipt of your response to this letter. If within the next 30 days from the date of this letter we have not received a <u>written</u> communication from you, we will take final action on your Department of the Army permit application. Final action could include deactivation of your permit application. Should the file be withdrawn it will be retained for a period of one year.

You are cautioned that any work performed below the mean high waterline or ordinary high waterline in waters of the United States, or the discharge of dredged or fill material into adjacent wetlands, without a Department of the Army permit could be subject to enforcement action. Receipt of a permit or endorsement from other agency does not obviate the requirement for obtaining a Department of the Army permit for the work described above prior to commencing work.

If you have any questions or comments regarding this case, you may contact Mr. José A. Cedeño-Maldonado, at telephones 729-6905/6944 ext. 3063, or at the letterhead address.

Sincerely,

José E. Rosario-Fábregas Chief, Antilles Regulatory Section

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Enclosures

Cedeño-Maldonado/CESAJ-DS-RD/jcm Rosario-Fábregas/CESAJ-DS-RD

bcc: JPA # 536 DNER (Mr. Celso Rossy) EQB (Ms. Wanda García) PRPB (Ms. Rose Ortiz)

Comments received on Public Notice dated March 5, 2004 Permit Application Number SAJ-2004-577 (IP-JCM)

- 1. State Historic Preservation Office (SHPO) letter dated March 3, 2004
- 2. Puerto Rico Ports Authority letter dated March 30, 2004
- The National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Habitat Conservation Division (NOAA Fisheries HCD) letter dated April 5, 2004
- 4. Environmental Protection Agency (EPA) electronic mail dated April 9, 2004
- 5. U.S. Fish and Wildlife Service (FWS) letter dated April 14, 2004
- The National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Protected Resources Division (NOAA Fisheries PRD) letter dated April 15, 2004



DEPARTMENT OF THE ARMY

JACKSONVILLE DISTRICT CORPS OF ENGINEERS
ANTILLES OFFICE
400 FERNANDEZ JUNCOS AVENUE
SAN JUAN, PUERTO RICO 00901-3299

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Antilles Regulatory Section SAJ-2004-577 (IP-JCM)

Mr. David B. Frasier Ocean Harvest Aquaculture, Inc. # 8 Surfside, Palmas del Mar Humacao, Puerto Rico 00791

Dear Mr. Frasier:

Reference is made to your Department of the Army (DA) permit application, regarding Ocean Harvest Aquaculture, Inc. proposed facilities. This proposal includes the installation of ten finfish aquaculture "Ocean Spar" cages within waters of the Caribbean Sea. More specifically, the cages would occupy a 54-acre site located two miles off shore, at a bearing of 150 degrees, from Palmas del Mar Marina, Humacao, Puerto Rico. Please refer to case number SAJ-2004-577 (IP-JCM), in future correspondence regarding this proposal.

We acknowledge receipt of your submittals titled Support Information to Environmental and Socio-Economic Evaluation II, and Jurisdictional Wetlands Determination Study regarding the subject proposal. Said documents were respectively received in our office on October 6, 2004 and October 14, 2004. We also acknowledge receipt of your October 21, 2004 fax transmittal of the Certification of Consistency with the Puerto Rico Coastal Zone Management Program (PRCZMP), which was issued by the Puerto Rico Planning Board (PRPB) on September 30, 2004 for the installation of the aforementioned aquaculture cages. In addition, we acknowledge receipt of three e-mails submitted by you on October 28, 2004, providing clarification of the information submitted on October 14, 2004, copy of the first Marine Currents Study for the proposed project cages site, and a revised location map for the proposed project cages site and fallowing area. The above-referenced documents were submitted in response to our September 17, 2004 request for additional information regarding your proposal.

We would like to note that in these submittals you described additional project components, not included in your original DA permit application. Therefore, these components were not included in the Public Notice issued by the Corps for the project. Said project components are related to the proposed construction of Fish Hatchery facilities within the Port of Yabucoa. As part of the Fish Hatchery facilities you propose to install a 60' x 12' floating dock, restore an existing 35' wide boat ramp, and install a seawater intake pipe and an outfall pipe within navigable waters of the Yabucoa Port.

The seawater intake pipe would consist of a 2" HDPE pipe, extending approximately 60' out from the shore, which would be secured to the sea bottom by cement anchors and nylon twine. This intake pipe would draw seawater into the hatchery facilities. The outfall pipe would consist of a 4" PVC pipe, extending approximately 100' into the harbor. This outfall pipe would discharge process waters from the hatchery facilities. An approximate 20' section of this pipe would be buried within a 12" wide trench to be excavated within navigable waters below the high tide line. The remaining section of the outfall pipe would be attached to the surface of the marine bottom with cement anchors.

As required by our regulatory procedures for the evaluation of permit applications, we are coordinating the information provided in your submittals with the federal resources management agencies (i.e. Fish and Wildlife Service, NOAA Fisheries and the State Historic Preservation Office), to update the project information available to them, and resolve their outstanding concerns, recommendations and objections regarding your proposal. Said coordination must be adequately completed prior to issuing a permit. The Corps will keep you informed about the results of such coordination.

On the other hand, please be advised that the PRCZMP, which was issued for your project does not consider the components associated to the proposed Fish Hatchery facilities. In order for the Corps to issue a permit, those components would also have to be included in the PRCZMP Certification of Consistency and the Water Quality Certificate (WQC) for the project. Therefore, you must inform the PRPB and the Puerto Rico Environmental Quality Board about these additional project components, so they can conduct their corresponding evaluations pertaining to the required PRCZMP Certification of Consistency and WQC.

You are cautioned that any work performed below the mean high waterline or ordinary high waterline in waters of the United States, or the discharge of dredged or fill material into adjacent wetlands, without a Department of the Army permit could be subject to enforcement action. Receipt of a permit or endorsement from other agency does not obviate the requirement for obtaining a Department of the Army permit for the work described above prior to commencing work.

If you have any questions or comments regarding this case, you may contact Mr. José A. Cedeño-Maldonado, at telephones 729-6905/6944 ext. 3063, or at the letterhead address.

Sincerely,

Marie G. Burns

Chief, Enforcement and Special Projects Branch

Cedeño-Maldonado/CESAJ-ØS-RD/jcm

Gerena/CESAJ-DS-RD

bcc: JPA # 536 DNER (Mr. Celso Rossy) EQB (Ms. Wanda García) PRPB (Ms. Rose Ortiz) March 30, 2004

Mr. José A. Cedeño Maldonado Antilles Regulatory Section U. S. Army Corps of Engineers 400 Fernández Juncos Avenue San Juan, PR 00901-3299

Permit Application No. SAJ-2004-577 (IP-JCM)

Dear Mr. Cedeño:

We refer to the Public Notice dated March 5, 2004 regarding the above permit application.

We have no objections to the approval of this permit. Accordingly with the information provided in the Notice, the works proposed will be located out of the Port of Yabucoa's Entrance Range.

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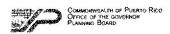
Luis S. Soto

Assistant Executive Director for

Planning, Engineering and Construction

LSS/COB/alo

Appendix 6 - Letters of Coordination Efforts with Puerto Rico Planning Board



MINILOS GOVERNMENT CENTER DE DIEGO AVE., STOP 22, SANTURCE PO BOX 41119, SAR JUAN, PUENTO RICO 000948-1119

September 30, 2004

Federal Consistency Determination CZ-2004-0114-061, (JPA-536) USACE No: SAJ-2004-577 IP-JCM Ocean Aquaculture Candelero Abajo Ward, Humacao

Dear Mr. Frazier:

This is in response to your application for Certification of Consistency with the Puerto Rico Coastal Zone Management Program (PRCZMP) in order to obtain a U.S. Army Corps of Engineers Permit for the installation of ten (10) finfish aquaculture "Ocean Spar" cages within waters of the Caribbean Sea over sandy bottom. The cages would occupy an area of 50 acres. Ocean Harvest will concentrate on potential endemic food fish, but the primary focus will be on the Florida pompano (Trachinotus carolinus) and cobia (Rachycentron canadam).

The proposed project would be located two (2) miles offshore, at a bearing of 150 degrees, from Palmas del Mar Marina, Humacao, Puerto Rico.

The review period of this Certification began on March 18, 2004. The application and accompanying documents were sent to the Fish & Wildlife Service (FWS), the National Marine Fisheries Services (NMFS), the Environmental Quality Board (EQB), the State Historic Preservation Office (SHPO), Underwater Archaeology Council (UAC), and the Municipality of Humacao. Public notices were also issued.

Comments were received from all the consulted agencies. A summary of the received comments follows:

EQB stated that the project applicant, presented compliance with 4 (c) Article.

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Page 2
Federal Consistency Determination
CV-2004-0114-061

• NMFS present some concerns to the project at reference. They commented that the proposed action could have direct and indirect adverse impacts to Essential Fish Habitat (EFH) and associated fishery resources. Specifically, the area where the proposed cages will be located is close to coral reef habitat and the input of autrients to waters in the area could lead to nutrient loading and increases in turbidity and suspended sediments in areas containing coral, which are extremely sensitive to nutrient concentrations and light penetration. They provided EFH conservation recommendations for the project in order to ensure the protection of fishery resources.

Based in their review of fish population data by University of Puerto Rico researchers and other scientists and information from the DNER, both species, the Florida pompano (Trachibotus carolinus) and cobia (Rachycentron canadum) are rare in the Caribbean. Accidental escapes of species that are not common in the Caribbean waters could affect occurring fish populations in the project area.

In addition recommends that a permit for the proposed project not be issued until the applicant has addressed the concerns of the agencies regarding potential adverse impacts of the projects on marine resources.

- FWS stated that the project is close to several coral reefs communities, Evaluation of impacts is necessary on nearby coral reefs from high nutrient loads which can be generated from this confined feeding of caged fish. Reverse currents, and other shifts in coastal water movement can transport excess nutrients into coralline areas which can prove detrimental. Excess nutrients can cause algae blooms that can adversely impact coral reefs and smother the coral colonies. They recommended that a CZM certificate for this project not be issued until the agency concerns are address. They submit some recommendations. (see enclosure)
- SHPO stated that their records indicate that no historic properties are located within the project's area of potential effects.
- UAC informed that the project is located in a high archaeological sensitivity area; they request underwater archeological studies Level IA-IB.

Pursuant to the Federal Consistency Procedure and submitted information, the Puerto Rico Planning Board has determined that the installation of ten finfish Ocean Spars cages within waters of the Caribbean Sea is consistent with the Puerto Rico Coastal Zone Management Program.

Page 3 Federal Consistency Octermination CZ-2004-0114-061

Nevertheless, the Puerto Rico Planning Board recommends the following:

Mr. Frazier shall coordinate with the Underwater Archaeology Council, Fish and Wildlife Services and National Marine Fisheries Services to explore and seek alternatives that allow for the best use and conservation of the natural

The PRPB is in the best disposition to cooperate in this effort. This final determination does not exempt the project to comply with any other procedure or permits of other State and Federal agencies. If you have any question concerning this matter does not hesitate to contact Mrs. Maryguel Fuentes at telephone 723-6200, extension 3067.

Cordially,

Jugus Jus -Angel IV Rodriegez Ckairman

Enclosure

c: Mr. Eldon Hont, OCRM, Maryland Mr. José Rosario, COE, San Juan Mr. Etnesto Díaz, PRCMO, DNER, San Juan Mr. Celso Rossy, DNER, San Juan Mrs. Wanda García, EQB, San Juan Dr. Lisumarie Carrubba, NMFS, Cabo Rojo

NAR/MML/MFL/mir



United States Department of the Interior

FISH & WILDLIFE SERVICE **Boqueron Field Office**

Carr. 301, KM 5.1, Bo. Corozo P.O. Box 491 Bequeron, PR-00622



Mr. Sindulfo Castillo Chief. Regulatory Section US Army Corps of Engineers 400 Fernandez Juncos Ave. San Juan, Puerto Rico 00901 - 3211

> Re: SAJ-2004-577 (JP-JCM), Ocean Harvest Aquaculture, Humacao

Dear Mr. Castillo:

The Service has received additional information regarding this project from the applicant. Our comments are issued in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Endangered Species Act (16 U.S.C. 1531 ct seq. as amended). We have assigned FWS tracking # 69-091-05-0192 to this action, please refer to it in future correspondence.

The Service has previously commented on this project on several occasions, based on the information provided by the applicant we have the following comments and recommendations:

- 1) The confusion as to the exact location of the proposed cages has been resolved. The proposed location should be distant enough (1 km or more from the closest reef) from any coastal marine ecosystems to avoid direct impacts.
- 2) Our concern with possible impacts to special aquatic sites has brought about the applicant's proposal of a "fallowing area". This corridor is 4.5 mile long and 1/4 of a mile wide. It is a deep water channel between two shallower reef or hard ground areas. This area is more protected but is also in closer proximity to reefs. We recommend that this area be eliminated and that a fallowing area, if needed, be located to the southeast of the present cage locations, in a direction further away from reef areas.
- 3) Project plans call for the placement of 10 cages for open water grow out. We recommend that the cages be placed in a phase approach with the first 5 cages being placed and monitored for a two year period prior to the installation of the additional cages. This will allow time to monitor the impacts of a lower number of cages and allow to progressively track impacts as more cages are installed.

- 4) With a phased cage placement the monitoring plan may have to be increased to 7 years, depending on the results of the data. Based on the recent results presented in the monitoring of the cages currently placed in Culebra we have the following additions to any future monitoring plans for this type of structures or activities.
 - a) Sediment traps should be placed in a pattern underneath and away from each cage to assess the amount, type and quality of sediments being released from the cages.
 - b) In addition to standard monitoring criteria, the applicant should consider monitoring for any additives, trace metals etc, which are part of the fish meal or other treatment to the fish.
 - c) Net fouling by marine organisms seems to be a chronic problem for the Culebra nets. During net cleaning operations it is expected that water quality will diminish due to suspended particulate material. Some monitoring of water quality should be carried out during net cleaning operations to document the temporary impacts.
 - d) In addition to fixed monitoring stations, several mobile stations should be added. The location of the mobile stations would be determined depending on the direction of the prevailing current at the time of monitoring. Also one monitoring point should be located inside each cage to compare water quality in the cage vs water quality outside of the cage.

Since the outstanding issues and concerns previously presented by the Service have been adequately addressed, we do not object to the issuance of a permit for this action.

Once a permit is issued for this action we would like a copy of the permit instrument with all special conditions, monitoring plan and requirements. In addition, we request that the permitee send copies of the monitoring plans directly to our office.

Thank you for the opportunity to comment on this project, if you have any questions please contact Felix Lopez of my staff at $787.851-7297 \times 226$.

Sincerely yours,

Edwin E. Muñiz Field Supervisor

fhl ce:

EPA, San Juan

EPA, New York NMFS, Lajas EQB, San Juan PRPB, San Juan (CZ-2004-0114-061) (JPA-536) Craig Lilyestrom, DNER, San Juan 3- 7-06; 2:34PM;





UNITED STATES DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration.
NATIONAL MARINE FISHERIES SERVICE

NATIONAL MARINE FISHERIES SERV Southeast Regional Office 263 13th Avenue South St. Petersburg, FL 33701 (727) 824-5312, FAX 824-5309 http://scro.nmfs.noaa.gov

FEB 7 2005

F/SER32: JCL

Mr. Sindulfo Castillo Chief, Antilles Regulatory Section U.S. Army Corps of Engineers 400 Fernandez Junoos Avenue San Juan, PR 00901-3299

Dear Mr. Castillo:

This responds to the U.S. Army Corps of Engineers' (COE), Jacksonville District, Antilles Office, request for consultation with the National Marine Fisheries Service (NMFS) pursuant to the Endangered Species Act of 1973 (ESA), on the Ocean Harvest, Inc. aquaculture project (SAJ-2004-577). Your request was made by letter on November 4, 2004, and additional information on the proposed project was provided by various correspondence, e-mails, and numerous phone conversations. Consultation was mitiated on October 31, 2005, once your water quality monitoring plan was finalized and received by the NMFS Habitat Conservation Division and Protected Species Division (PRD). The NMFS' PRD has reviewed the following documents: Environmental and Socio-Economic Evaluation I, Ocean Harvest Aquaculture, ine.; Support information to Environmental and Socio-Economic Evaluation II, Ocean Harvest Aquaculture, Inc.; and the revised Ocean Harvest Aquaculture location map for the proposed cage location, with respect to potential effects on ESA-listed species and designated critical habitat under the purview of NMFS. You concluded that the project may affect, but is not likely to adversely affect threatened or endangered species under NMFS' purview, specifically the humpback whale (Megaptera novaeangliae), the green turtle (Chelonia mydas), the leatherback turtle (Dermochelys coriacea), and the hawkshill turtle (Ereimochelys imbricata), or their critical habitat, and requested our concurrence with your determination.

Phase I of the proposed action will consist of the construction of a fish hatchery facility located at a 2-acre site in the Port of Yabucoa, on the south coast of Puerto Rico. The land-based facility will include offices, parking areas, storage areas, a production area, a 60 ft x 12 ft floating dock, restoration of an existing 35 ft wide boat ramp, and the installation of a seawater intake and outfall pipe. The seawater intake pipe would consist of a 2-inch high-density polyethylene pressure pipe, extending approximately 60 ft into the water along the sea bottom. The outfall pipe would consist of a 4-inch polyvinyl chloride pipe, extending approximately 100 ft into the harbor, which would discharge processed waters from the hatchery facilities. Phase II of the proposed action will consist of the deployment and mooring of ten 3000 m³ submerged cages (Sea Station 3000 m³) for the grow-out of cobia (Rachyventron canadum) and Caribbean spiny lobster (Panalirus argus) to a commercial scale. To address NMFS Habitat Conservation Division's concerns, you indicate in your letter of October 31; 2005; that as part of the action, a detailed water quality monitoring plan will be implemented during cage deployment and operation in order to determine whether the cage installation and operation results in adverse impacts to Essential Fish Habitat (BFH) and associated fishery species.



The proposed site location for cage deployment is two miles southeast, at a bearing of 150 degrees, from Palmas del Mar Marina, Humacao, Puerto Rico, between the municipalities of Humacao and Yabucoa. The site area is approximately 54 acres or 250,000 m². Each cage will be located in 4 acre tracts equally spaced two abreast and five deep on a 500-m x 500-m area. The cages will be 25-m diameter diamond shaped, approximately 42 ft in height and 75 ft wide at the middle, constructed of a synthetic mesh, with a net depth of 15 m, and will be connected to a steel pipe framework. The total volume of each cage will be approximately 3,000 m³. The cages will be placed at a depth of approximately 108 ft (35 m) and will be secured to the bottom using a four-point mooring system consisting of four 3,000-lb (9 ft wide) anchors and an 8 ft diameter main central ballast that would rest on the sea floor. Each net will be submerged 40 ft from the surface, out of the high-energy zone in order to reduce the risk of harm to the cage or to the fish in the event of large ocean swells generated from stormy conditions.

Listed species under the purview of NMFS protected by the ESA and which are considered under this ESA section 7 consultation include the loggerhead (Caretta caretta), green (Chelonia mydas), leatherback (Dermochelys coriacea), hawksbill (Eretmochelys imbricata), olive ridley (Lepidochelys olivacea), and Kemp's ridley (Lepidochelys kempit) sea turtles. These sea turtle species are known to occur in the waters of Puerto Rico and the U.S. Virgin Islands and may occur in the action area; however, Kemp's and olive ridleys are rarely there. ESA-listed whales are known to occur in deep, offshore waters near the action area; however, the most current NOAA cetacean survey (February-March 2001) did not observe any humpback whales within the action area. We have analyzed the proposed action and believe the only routes of potential effects to sea turtles and whales are from direct impacts from entanglement in the cage structures and/or mooring systems, and indirectly from water quality degradation. The project area is not in critical habitat for any listed species; therefore, critical habitat will not be affected.

NMFS believes this project's overall effects on sea turtles and whales will be discountable or insignificant based on the project's specifications and location. Entanglements to sea turtles and whales are unlikely to occur with the netting used for the construction of offshore cages; the proposed netting consists of tight Spectra knotless webbing constructed of 3.0-inch (76 mm) stretch mesh. Based on the information provided, the netting will be kept tightly stretched to avoid any risk of entanglement, and there will not be any floats, buoys, or loose trailing lines which might entangle sea turtles or whales. In addition, the mariculture operation is monitored closely on a daily basis weather permitting, to ensure automatic feeders are working properly, to stock the feeders, and to discourage poaching. To date, there have been no documented entanglements of sea turtles or whales with this type of cage in previous studies including a similar aquaculture project (Snapperfarm) that has been operating for nearly two years at Culebra, Puerto Rico, at similar depths.

Degradation of water quality by aquaculture operations may pose a risk to resident sea turtles, although NMFS considers the risk discountable for whales, which are transient. Many land-based aquaculture operations have been shown to have many problems with poor water quality conditions (e.g., high ammonia, nitrite, nitrate, and phosphate levels), disease, and poor quality in the grow-out finfish. However, at the Culebra, Puerto Rico, cage culture project, water quality analyses indicate that there were no statistical differences for ammonia, nitrate, nitrite, and phosphate concentrations in the water or in the organic matter and organic nitrogen in the sediments, between the cage site and the control site. The authors of the Environmental and Social Economic Evaluation report as well as the Snapperfarm final report believe that open-ocean cage systems have lower environmental impacts than traditional aquaculture methods because degraded water quality conditions are significantly diminished in open-ocean cage sites, where strong currents flowing into deeper waters quickly dilute wastes. Also, as part of the action, the COE indicates there is a detailed water quality monitoring plan that will be implemented during cage deployment and operation in order to determine whether the cage installation and operation results in any adverse impacts to EFH and associated fishery species. If the results of the water quality monitoring plan determine that any adverse impacts have resulted from either the cage installation or

3/ 4

operation, then the COE indicates that they will reinitiate ESA section 7 consultation. Lastly, the COE indicates that the discharge process waters from the hatchery facilities will meet or exceed the Class B Water Quality Criteria, which is the Environmental Protection Agency's water quality standard for the area.

Minimal impacts associated with the fish hatchery construction activity are expected; however, these are limited to short-term and temporary impacts since project plans will include appropriate measures to control for erosion, dust, noise, light, and sediment control during construction activity.

Based on the above information, we have determined that the action is not likely to adversely affect, ESA-listed species under our purview. This concludes your ESA section 7 consultation responsibilities with NMFS. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. We have enclosed additional information on other statutory requirements that may apply to this action, as well as NMFS' new mechanism to allow you to track the status of this and other ESA consultations.

Thank you for your continued cooperation and assistance in the conservation of threatened and endangered species. If you have any questions please contact Mr. Juan Levesque, protected species biologist, at (727) 824-5312, or by e-mail at Juan.Levesque@noaa.gov.

Sincerely yours

Roy E. Crabtree, Ph.D. Regional Administrator

Enclosure

Ref: I/SER/2004/01676 File: 1514-22.f.1, PR

3

Additional Considerations for ESA Section 7 Consultations (Revised 12-6-2005)

Marine Mammal Protection Act (MMPA) Recommendations: The Endangered Species Act (ESA) section 7 process does not authorize incidental takes of listed or non-listed marine mammals. If such takes may occur an incidental take authorization under MMPA section 101 (a)(5) is necessary. Contact Ken Hollingshead of our NMFS Headquarters' Protected Resources staff at (301) 713-2323 for more information on MMPA permitting procedures.

Essential Fish Habitat (EFH) Recommendations: In addition to its protected species/critical habitat consultation requirements with NMFS' Protected Resources Division (PRD) pursuant to section 7 of the ESA, prior to proceeding with the proposed action the action agency must also consult with NMFS' Habitat Conservation Division (HCD) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act's (MSA) requirements for essential fish habitat (EFH) consultation (16 U.S.C. 1855 (b)(2) and 50 CFR 600.905-.930, subpart K). The action agency should also ensure that the applicant understands the ESA and EFH processes; that ESA and EFH consultations are separate, distinct, and guided by different statutes, goals, and time lines for responding to the action agency; and that the action agency will (and the applicant may) receive separate consultation correspondence on NMFS letterhead from HCD regarding their concerns and/or finalizing EFH consultation.

Public Consultation Tracking System (PCTS) Guidance: PCTS is an online query system allowing federal agencies and U.S. Army Corps of Engineers' (COE) permit applicants to track the status of NMFS consultations under ESA section 7 and under MSA sections 305(b)2 and 305(b)(4): Essential Fish Habitat. Access PCTS via: www.nmfs.noaa.gov/pcts. Federal agencies are required to enter an agency-specific username and password to query the Federal Agency Site. The Corps Permit Site allows COE permit applicants the ability to check on the current status of Clean Water Act section 404 permit actions for which NMFS has conducted an ESA section 7 consultation with the COE since the beginning of the 2001 fiscal year (no password needed).

For COE-permitted projects, click on "Enter Corps Permit Site." From the "Choose Agency Subdivision (Required)" list, pick the appropriate COE district. At "Enter Agency Permit Number" type in the COE district identifier, hyphen, year, hyphen, number. The COE is in the processing of converting its permit application database to PCTS-compatible "ORM." An example permit number is: SAJ-2005-000001234-IPS-1. For the Jacksonville District, which has already converted to ORM, permit application numbers should be entered as SAJ (hyphen), followed by 4-digit year (hyphen), followed by permit application numeric identifier with no preceding zeros. E.g., SAJ-2005-123, SAJ-2005-1234, SAJ-2005-12345.

For inquiries regarding applications processed by Corps districts that have not yet made the conversion to ORM (e.g., Mobile District), enter the 9-digit numeric identifier, or convert the existing COE-assigned application number to 9 numeric digits by deleting all letters, hyphens, and commas; converting the year to 4-digit format (e.g., -04 to 2004); and adding additional zeros in front of the numeric identifier to make a total of 9 numeric digits. E.g., AL05-982-F converts to 200500982; MS05-04401-A converts to 200504401. PCTS questions should be directed to Eric Hawk at Eric Hawk@noaa.gov. Requests for username and password should be directed to April Wolstencroft (PCTSUsersupport@noaa.gov).

---- Forwarded by Maria Clark/R2/USEPA/US on 04/12/2007 01:27 PM -----

lisamarie carrubba <Lisamarie.Carrubba@noaa.gov> 03/19/2007 01:51 PM

To

"Cedeno-Maldonado, Jose SAJ" <Jose.Cedeno-Maldonado@saj02.usace.army.mil>, Maria Clark/R2/USEPA/US@EPA

CC

Eric Hawk < Eric. Hawk@noaa.gov>, Robert Hoffman < Robert. Hoffman@noaa.gov>, teletha Mincey < Teletha. Mincey@noaa.gov> Subject

Ocean Harvest SAJ-2004-577

At Cedeño's request, I am writing to clarify that the February 7, 2006, letter from NMFS Protected Resources Division closing ESA Section 7 consultation for permit application number SAJ-2004-577 mistakenly noted that the Ocean Harvest Aquaculture Inc. project would include the grow out of Caribbean spiny lobster. NMFS acknowledges that the Ocean Harvest project as proposed will only involve cage culture of cobia.

Lee

Dr. Lisamarie Carrubba NOAA Fisheries Service Caribbean Field Office 787-851-3700



DEPARTMENT OF THE ARMY

JACKSONVILLE DISTRICT CORPS OF ENGINEERS
ANTILLES OFFICE
400 FERNANDEZ JUNCOS AVENUE
SAN JUAN, PUERTO RICO 00901-3299

Antilles Regulatory Section SAJ-2004-577 (IP-JCM)

JUL - 6 2006

Mr. David Bernhart Assistant Regional Administrator Protected Resources Division National Marine Fisheries Service Southeast Regional Office 263 13th Avenue South St. Petersburg, Florida 33701

Dear Mr. Bernhart:

Reference is made to Department of the Army (DA) permit application number SAJ-2004-577 (IP-JCM), regarding Ocean Harvest Aquaculture, Inc. (OHA) proposed installation of ten finfish aquaculture "Ocean Spar" cages within waters of the Caribbean Sea. More specifically, the cages would occupy a 54 acres site located two miles off shore, at a bearing of 150 degrees, from Palmas del Mar Marina, Humacao, Puerto Rico. In addition, the referenced proposal includes the development of Fish Hatchery facilities at the Port of Yabucoa. Please refer to the above permit application number in future correspondence regarding this case.

Reference is also made to phone conversations and e-mail exchanges (from June 15, 2006) between José A. Cedeño-Maldonado, from my staff, and Dr. Lisamarie Carrubba, from your staff regarding subject permit application.

The U.S. Army Corps of Engineers (Corps) was recently contacted by Ms. María Clark from the Environmental Protection Agency (EPA). Ms. Clark is now coordinating EPAs National Environmental Policy Act (NEPA) compliance evaluation for Ocean Harvest Aquaculture, Inc. (OHAI) proposal, as pursuant to the corresponding NPDES permit application.

Ms. Clark has informed that as part of EPA's evaluation of the project documentation, they noticed that the Corps' coordination with National Marine Fisheries Service (NMFS), pursuant to Section 7 of the ESA, did not include *Acropora spp.* EPA understands that in consideration of the new ruling, listing *Acropora palmata* and *Acropora cervicornis* as federally threatened species, additional coordination with the NMFS would be appropriate regarding those species. The Corps agrees with EPA's

assertion that Acropora spp. should be included in the Section 7 consultation for the project.

Based on the above, in order to support EPAs evaluation and to avoid EPA from having to initiate a new Section 7 consultation with NMFS for the project, the Corps hereby requests NMFS to include *Acropora palmata* and *Acropora cervicornis* in our Section 7 consultation for the referenced project.

The information submitted by the applicant states that neither *Acropora palmata* nor *Acropora cervicornis* are present within, or in the vicinity of the project areas (both the cages site and the land based hatchery facilities). On the other hand, based on information provided by NMFS, the Corps understands that there is a possibility that *Acropora palmata* may be found in the coral areas located in the vicinity of the Yabucoa Harbor and the project hatchery facilities.

However, the Corps understands that the Environmental Monitoring Plan (including water quality and benthic habitat monitoring) and corresponding contingency measures to be implemented during the operation of the project (including the staggered deployment of the proposed cages), as a requirement of the DA Permit, would effectively prevent and minimize any potential effects on corals. Said Environmental Monitoring Plan and corresponding contingency measures were subject to review and approval by NMFS during our coordination for the project.

Based on the above, the Corps has determined that the proposed project may affect, but is not likely to adversely affect the above referenced federally listed threatened species. By this mean, we request concurrence from the National Marine Fisheries Service – Protected Resources Division with the above determination, as part of our previous Section 7 consultation for the project.

Thanks for your cooperation with our regulatory program. If you have any questions or comments regarding this case, you may contact Mr. José A. Cedeño-Maldonado, at telephone numbers 729-6905/6944 ext. 3063, or at the letterhead address.

Sincerely,

Sindulfo Castillo

Chief, Antilles Regulatory Section

Copy Furnished:

Ms. Lisamarie Carrubba, Ph.D., Caribbean Field Office, Protected Resources Division, National Marine Fisheries Service, PO Box 3323, Lajas, Puerto Rico 00667-3323



UNITED STATES DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration NATIONAL MARINE FISHERIES BERVICE

Southeast Regional Office 263 13th Avenue South St. Petersburg, FL 33701 (727) 824-5312, FAX (727) 824-5309 http://sero.mmfs.noss.gov AUG - 4 2006

F/SER31:LC

Mr. Sindulfo Castillo.
Chief, Antilles Regulatory Section
Department of the Army, Corps of Engineers
400 Fernández Juncos Avenue
San Juan, PR 00901-3299

Dear Mr. Castillo:

This responds to your letter dated July 6, 2006, for our concurrence with your determination that permit application number SAJ-2004-577 requesting the installation of ten finfish cages within a 54-acre site east of Palmas del Mar Marina, Humacao, Puerto Rico, may affect, but is not likely to adversely affect, elkhorn corals (Acropora palmata) or staghom corals (A. cervicornis). The U.S. Army Corps of Engineers (COE) completed a section 7 consultation under the Endangered Species Act (ESA) with the National Marine Fisheries Service (NMFS) for the project on February 2, 2006, prior to the listing of these two coral species as threatened. That consultation did not include or make a determination of potential project impacts to these two coral species.

Although historic information indicates that elkhorn corals were present on reefs in Yabucoa Bay and cays off the coast of Humacao, the benthic surveys performed for the Ocean Harvest project found no elkhorn coral on reefs surveyed in the action area. This includes Yabucoa Harbor where the hatchery facility will be located, the areas where the cages will be installed, and the coral reef areas that will be used as monitoring sites. The latter are part of the environmental monitoring plan to be implemented as one of the special conditions of any permit issued by the COE. NMFS believes that, should threstened coral species be present on reefs in the action area, impacts to these species resulting from the proposed cage operation are unlikely because: 1) The cage site itself will be located in an area characterized by sandy bottom with no coral growth; 2) the location of the nearest reef is at least 5,280 ft (one mile) from the proposed cage site, and environmental monitoring data from a similar cage operation in Culebra indicated that the benthic area affected by that cage operation extended only approximately 1,300 ft (1/4-mile) bayond the area of the cages; and 3) current meter data from the proposed Ocean Harvest cage site indicate that prevailing currents do not move toward areas of coral reefs. Therefore, NMFS concurs with your determination that the proposed project may affect but is not likely to adversely affect threatened coral species. However, should additional information on listed or proposed species become available or the project be modified, this determination may be reconsidered.

D.E. Alston, A. Cabarcas, J. Capelle, D.D. Benetti, and R. Cortés. 2004. Final Report for National Marine Aquaculture Initiative: Environmental Impact of Sustainable Offshore Cage Culture Production in Puerto Rican Waters. University of Puerto Rico, Mayagüez, Puerto Rico.



¹ C. Goenaga and G. Cintrón. 1979. Inventory of the Fuerto Rican Coral Reefs. Department of Natural Resources, San Juan, Puerto Rico.

ELH-KERITON-S

787 651 5588

NDAA_FISHERIES/CARIBBEAN AUG-11-2006 08:30 AM

Thank you for your efforts to ensure the conservation of protected species and their habitat. If you have any questions regarding ESA consultation requirements or our position on the Ocean Harvest project, please contact Dr. Lisamarie Carrubba at (787) 851-3700, or by e-mail at lisamarie carrubba@nosa.gov.

Sincerely,

Roy B. Crabtree, Ph.D. Regional Administrator

1514-22.F.1.PR File: L/SER/2006/03242 Ref:

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TOTAL P.03



STATE HISTORIC PRESERVATION OFFICE Office of the Governor

March 3, 2004

Mr. Edwin E. Muñiz Chief, Regulatory Section U.S. Army Corps of Engineers 400 Fernández Juncos Ave. San Juan, P.R. 00901-3299

SHPO: 03-01-04-02 MARINE AQUACULTURE, 54 ACRE SITE LOCATES WITHIN NAVIGABLE WATERS OF THE CARIBBEAN SEA, TWO MILES OFFSHORE, HUMACAO, PUERTO RICO/SAJ-2004-577 (IP-JCM)

Dear Mr. Muñiz:

Our Office has received and reviewed the above referenced project in accordance with Section 106 of the National Historic Preservation Act of 1966 (Public Law 102-575) as amended in 1992 and 36 CFR Part 800: Protection of Historic Properties from the Advisory Council on Historic Preservation. The State Historic Preservation Officer (SHPO) is to advise and assist federal agencies when identifying historic properties, assessing effects upon them, and considering alternatives to avoid or reduce the project's effects on them.

Our records support your finding that no historic properties are located within the project's area of potential effects.

If you have any questions concerning our comments, please do not hesitate to contact us. Please note that should the Agency discover other historic properties at any point during project implementation, you should notify the SHPO immediately. We appreciate your interest in the rescue and preservation of our national historical heritage and we reiterate our commitment to assist you in this endeavor.

Sincerely,

Enid Torregrosa de la Rosa, MSHP State Historic Preservation Officer

ETD/MB/img



PO Box 9066581 San Juan PR 00906-6581 • Phone (787) 721-3737 Fax (787) 722-3622



STATE HISTORIC PRESERVATION OFFICE Office of the Governor

November 22, 2004

Ms. Marie G. Burns Chief, Enforcement and Special Projects Branch U. S. Army Corps of Engineers Antilles Office 400 Fernández Juncos Ave. San Juan, P.R. 00901-3299

SHPO: 03-01-04-02 MARINE AQUACULTURE, 54 ACRE SITE LOCATED WITHIN NAVIGABLE WATERS OF THE CARIBBEAN SEA, TWO MILES OFFSHORE PLUS ADDITIONAL PROJECT COMPONENTS, HUMACAO, PUERTO RICO/SAJ-2004-577 (IP-JCM)

Dear Ms. Burns:

Our Office received correspondence on November 5, 2004 regarding the above referenced project. While we believe that an Agency's finding of **no historic properties affected** is appropriate for this undertaking, the U.S. Army Corps of Engineers will need to submit an official determination for our review in order to complete the Section 106 review.

If you have any questions regarding our comments, please do not hesitate to contact our Office. We appreciate your interest in the rescue and preservation of our national historical heritage and we reiterate our commitment to assist you in this endeavor.

Sincerely,

Elizabeth Solá Oliver

State Historic Preservation Officer

ESO/MB/img



PO Box 9066581 San Juan PR 00906-6581 • Phone (787) 721-3737 Fax (787) 722-3622



DEPARTMENT OF THE ARMY

JACKSONVILLE DISTRICT CORPS OF ENGINEERS
ANTILLES OFFICE
400 FERNANDEZ JUNCOS AVENUE
SAN JUAN, PUERTO RICO 00901-3299

Antilles Regulatory Section SAJ-2004-577 (IP-JCM)

II 3 !

Ms. Elizabeth Solá Oliver State Historic Preservation Officer State Historic Preservation Office (SHPO) Office of the Governor P.O. Box 9066581 San Juan, PR 00906-6581

Dear Ms. Solá Oliver:

Reference is made to Department of the Army (DA) Permit Application No. SAJ-2004-577 (IP-JCM), regarding Ocean Harvest Aquaculture, Iric. proposal for the installation of ten aquaculture cages within a 54 acres area located two miles off shore from the coast of Humacao, Puerto Rico, and the construction of fish hatchery facilities within an approximately two-acres site, which adjoins the Port of Yabucoa. SHPO's case number for this project is SHPO: 03-01-04-02.

We acknowledge receipt of your letter dated November 22, 2004 regarding this case. Said letter was received in our office on November 30, 2004, in response to our November 1, 2004 transmittal of updated information about subject project.

Based on the information available, including the above-referenced letter from SHPO, the Corps determines that the proposed project would not affect historic properties within the area of potential effect. This determination is made in accordance with 33CFR 325, Appendix C, 7.b and 36CFR 800.4(d)(1).

If you have any questions or comments regarding this case, you may contact Mr. José A. Cedeño-Maldonado, at telephone numbers 729-6905/6944 ext. 3063, or at the letterhead address.

Sincerely,

Sindulfo Castillo

Chief, Antilles Regulatory Section

1/31/05

Cedeño-Maldonado/CESAJ-DS-RD/jcm Castillo/CESAJ-DS-RD

STATE HISTORIC PRESERVATION OFFICE Office of the Governor

February 16, 2005

STAN STANSIS

Mr. Sindulfo Castillo Chief, Antilles Regulatory Section U.S. Army Corps of Engineers 400 Fernández Juncos Ave. San Juan, P. R. 00902-3299

SHPO: 03-01-04-02 MARINE AQUACULTURE, 54 ACRE SITE LOCATED WITHIN NAVIGABLE WATERS OF THE CARIBBEAN SEA, TWO MILES OFFSHORE, HUMACAO, PUERTO RICO/SAJ-2604-577 (IP-JCM)

Dear Mr. Castillo:

Dear Mr. Castillo:

Our Office has received and reviewed the above referenced project in accordance with Section 106 of the National Historic Preservation Act of 1966 (Public Law 102-575) as amended in 1992 and 36 CFR Part 800: Protection of Historic Properties from the Advisory Council on Historic Properties from the Advisory Council on Historic Proservation. The State Historic Preservation Officer (SHPO) is to advise and assist federal agencies when identifying historic properties, assessing effects upon them, and considering alternatives to avoid or reduce the project's effects on them.

Our records support your finding that no historic properties are located within the project's area of potential effects.

If you have any questions concerning our comments, please do not hesitate to contact us. Please to the that should the Agency discover other historic properties at any point during project implementation, you should notify the SHPO immediately. We appreciate your interest in the rescue and preservation of our national historical heritage and we reiterate our commitment to assist you in this endeavor.

Sincerely,

Sincerely,

Min Mil Mil

Right Mistoric Preservation Officer

ESO/MB/img

l de Ballajā • Phone 17871 721-3737 Fax (787) 722-3622 PO Box 9066581 San Juan PR (0906-658)

"Cedeno-Maldonado, Jose SAJ" <Jose.Cedeno-Maldonado@saj02.usace.army.mil> 06/08/2006 01:28 PM

Maria:

As agreed I am forwarding an e-mail that we sent to OHAI, discussing the coordination with SHPO.

Please let me know if you have any questions in this regard.

Cordially,

José A. Cedeño-Maldonado, M.S.
Project Manager
U.S. Army Corps of Engineers
Jacksonville District - Antilles Regulatory Section
400 Fernández Juncos Ave.
San Juan, Puerto Rico 00901-3299
Tel. (787) 729-6905/6944 Ext. 3063
Fax. (787) 729-6906

From: Cedeno-Maldonado, Jose SAJ

Sent: Tuesday, September 20, 2005 1:28 PM

To: 'David B frazier msn'

Cc: Maria Soto; Schlueter.Edward@epamail.epa.gov; Wirth.Nikolaus@epamail.epa.gov; Castillo, Sindulfo

SAJ; Maldonado, Maria V SAJ **Subject:** RE: SHPO - OHAI

Mr. Frasier:

As I explained over the phone earlier today, the letters that I sent you to/from SHPO make reference to each other, and are sequential responses to one another. If you read our letters to SHPO, you will find that they describe both the cages site and the fish hatchery facilities. SHPO's responses were provided based on the determinations made by the Corps in those letters. Therefore, SHPO's final determination from February 16, 2005 refers to both project components. Based on the final letter from SHPO, we deemed our National Historic Preservation Act (NHPA) consultation complete. I am confident that once you forward and explain this to EPA as part of your response to their request, and they review the correspondence, in addition to the documentation that we submitted to them previously, they should be able to reach a similar determination regarding the project's compliance with NHPA. However, if they still have concerns, then they would have to coordinate with SHPO or request that you coordinate with SHPO and provide additional clarification. In that regard, the Corps involvement in any pending coordination with SHPO or any of the other federal resource agency, regarding EPA's NEPA requirements for your proposal, would be limited to providing copies of the documentation already generated during our evaluation of the project. As you are aware, we already submitted the vast majority of our documentation to EPA.

If you are interested in reviewing our files for your project once again to obtain any documents, which you may understand EPA does not presently have, you are welcome to request an appointment with Ms. Vicky Maldonado from our office, at extension 3053.

Cordially,

José A. Cedeño-Maldonado, M.S. Project Manager

U.S. Army Corps of Engineers Jacksonville District - Antilles Regulatory Section 400 Fernández Juncos Ave. San Juan, Puerto Rico 00901-3299 Tel. (787) 729-6905/6944 Ext. 3063 Fax. (787) 729-6906

From: David B frazier msn [mailto:atc_dbf@msn.com]

Sent: Tuesday, September 20, 2005 12:03 PM

To: Cedeno-Maldonado, Jose SAJ

Cc: Maria Soto; Schlueter.Edward@epamail.epa.gov; Wirth.Nikolaus@epamail.epa.gov

Subject: SHPO

Dear Jose Cedeno-Maldonado:

I received your fax copy of US Army Corp. of Engineers(COE) letter 1/31/05 and State Historic Preservation Office(SHPO) response dated 2/16/05. In the COE letter it states that the proposed hatchery site does not affect historic property. However in the SHPO response and concurrence, it only references the project's area, as being defined in the Subject line as "54 acre site located within navigable waters of the Caribbean sea, two miles offshore, Humacao Puerto Rico." No reference is made to the Yabucoa hatchery site, nor it not affecting historic property. EPA August 2, 2005 letter to Ocean Harvest Aquaculture Inc.(OHA) is specifically requesting OHA provide additional evidence from SHPO that both onshore and offshore elements have no affect on historical property.

EPA August 2 2005 letter also request compliance with the Magnuson-Stevens Fishery Conservation and Management Act and Endangered Species Act under the coordination of the U.S. Fish and Wildlife Services(USFW) and National Marine Fisheries Service(NMFS).

The above three agencies USFW,NMFS, and SHPO officially correspond with your agency(COE) on these manners regarding the OHA project. OHA will need to be provided by the COE documentation regarding these issues to complete the EPA 8/2/05 request.

Sincerely:

David B Frazier Ocean Harvest Aquaculture Inc, Humacao, Puerto Rico. 787.852.2334 ph/fax 787.397.9592 cell



UNITED STATES DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration

NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office 263 13th Avenue South St. Petersburg, Florida 33701-5511 (727) 824-5317; FAX (727) 824-5300 http://sero.nmfs.noaa.gov/

June 28, 2006

F/SER4:DD

Mr. Sindulfo Castillo
Chief, Antilles Regulatory Section
Department of the Army, Corps of Engineers
400 Fernandez Juncos Avenue
San Juan. Puerto Rico 00901-3299

Dear Mr. Sindulfo:

NOAA's National Marine Fisheries Service (NMFS) has reviewed your letter, dated June 21, 2006, regarding permit application number SAJ-2004-577(IP-JCM). The applicant, Ocean Harvest Aquaculture, Inc., requested authorization to install cages in the Caribbean Sea two miles offshore of Palmas del Mar Marina, Humacao, Puerto Rico. Your letter is in response to our essential fish habitat (EFH) conservation recommendations provided by letter dated November 29, 2004.

The information concerning the modified plans, and the actions to be implemented, largely incorporate or otherwise address NMFS' recommendations and, therefore, the goals of the Magnuson-Stevens Fishery Conservation and Management Act and the regulations for implementing the EFH requirements of the Act would be met. We sincerely appreciate efforts by the applicant and your staff to protect our Nation's living marine resources. Related action or matters needing our attention should be directed to the attention of David Dale at David.Dale@noaa.gov.

Sincerely,

Miles M. Croom

Assistant Regional Administrator Habitat Conservation Division

cc: (via electronic mail) F/SER3-Carrubba FSER46-Ruebsamen



/ for

Appendix D: Puerto Rico Environmental Quality Board - Water Quality Certificate



Governing Board

RETURN RECEIPT REQUESTED

August 29, 2006

Mr. David Frazier President Ocean Harvest Aquaculture, Inc. 8 Surfside Street, Palmas del Mar Humacao, Puerto Rico 00791

Dear Mr. Frazier:

RE: WATER QUALITY CERTIFICATE
OCEAN HARVEST AQUACULTURE INC.
TWO (2) MILES OFFSHORE FROM PALMAS DEL MAR MARINE
HUMACAO, PUERTO RICO
NPDES NO. PR0026506

We have received and reviewed the application for a permit under Section 402, National Pollutant Discharge Elimination System (NPDES), of the Federal Clean Water Act, as amended (33 U.S.C. 466 et. seq.) (the Act) for the referenced facility. We also have received and reviewed a request submitted by Ocean Harvest Aquaculture, Inc. (OHAI), to modify the final Water Quality Certificate (WQC) issued on September 30, 2005. The request modification to the aforementioned WQC consist of the following:

- 1. Replace Special Condition 14 of the WΦC by the following conditions:
 - a) The permittee shall dispose of accumulated solids and attached marine growth contained within or on the net-pen in a manner, which prevents to the maximum extent practical these materials from entering or reentering the receiving water body.
 - b) The permittee shall recover floating debris and trash, which enters the receiving water incidental to the operation of the facility.

Environmental Agencies Bidg., 1308 Ponce de León Áve., State Road 8838, Río Piedras, PR 00918 PO Box 11488, San Juan, PR 00910 Tel. 787-767-8181 • Fax 787-787-4861 Mr. David Frazier WQC Ocean Harvest Aquaculture, Inc. NPDES No. PR0026506 Page 2

- Modify Special Conditions 8 and 9, to read as follows:
 - a) 8. Solids from the production system shall not cause deposition in the bottom of the receiving water body in such amount that be deleterious to the existing or designated uses of the receiving water body.
 - b) 9. OHAI shall implement an annual monitoring program to determine if the solids generated due to this activity cause deposition in the bottom of the receiving water body in such amount that be deleterious to the existing or designated uses of the receiving water body. The monitoring program shall commence no later than thirty (3D) days after the EQB's written approval of the Quality Assurance Project Plan (QAPP). The QAPP must be submitted for evaluation and approval of EQB no later than thirty (30) days after the Effective Date of the Permit (EDP). The results of the monitoring program shall be submitted to EQB no later than sixty (60) days of completion of the monitoring program. Based on the evaluation of the results obtained, EQB will determine if it is necessary to revoke the Water Quality Certificate.
- 3. Modify in the Tables A-1 y A-2 the following:
 - a) Eliminate the following parameters: Surfactants (as MBAS) and Sulfates.
 - b) Add the phrase "in Situ" in the column of Sample Type for the parameters of Temperature, Dissolved Oxygen, pH and Turbidity to read "Grab or in Situ".

Pursuant to Section 401 (a) (1) of the Act, after due consideration of the applicable provisions established in the Puerto Rico Water Quality Standards Regulation (PRWQSR), as amended and in Sections 208(e), 301, 302, 303, 304(e), 306 and 307 of the Act, it is certified that there is reasonable assurance as determined by the Environmental Quality Board (EQB) that the alluded discharge will not cause violations to the applicable water quality standards at the receiving water body if the limitations and monitoring requirements on Tables A-1 and A-2 are met. The conditions specified in the aforementioned tables shall be incorporated into the NPDES permit in order to satisfy the provisions of Section 301 (b) (1) (C) of the Act.

Mr. David Frazier WQC Ocean Harvest Aquaculture, Inc. NPDES No. PR0026506 Page 3

If you have any objection to the WQC, you have the right to request a reconsideration to the EQB within the statutory period (twenty (20) calendar days from the date that the WQC is received).

The Agency reserves the right to comment at a later date concerning other environmental aspects of the discharge.

Angel O. Berrios Silvestre, P.E. Associate Member

Eugene Scott Amy, Esq. Vice Chairwoman

Carlos W. López Freytes, Esq Chairman

HJCA/lmr

Mr. Walter E. Andrews, EPA-Region II Eng. Carl-Axel P. Soderberg, EPA-CEPD

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SPECIAL CONDITIONS

NPDES NO. PR0026506

These special conditions are an integral part of the Water Quality Certificate (WQC) and shall be incorporated into the NPDES permit in order to satisfy the provisions of Section 301(b)(1)(C) of the Federal Clean Water Act (CWA) as amended (33 U.S.C. 466 et seq.):

- To discharges will only consist of fish excrement and unconsumed fish food and medications coming from production system. The maximum number of fish stocked shall no exceed 25,000 Cobia fishes per cage.
- 2. The permittee shall install, maintain and operate all water pollution control equipment in such a manner as to be in compliance with the applicable Rules and Regulations.
- 3. No toxic substances shall be discharged in toxic concentrations other than those allowed as specified in the NPDES permit. Those toxic substances included in the permit application, but not regulated by the NPDES permit, shall not exceed the concentrations specified in the applicable regulatory limitations. 23
- 4. The waters of Puerto Rico shall not contain any substance attributable to discharge at such concentration which, either alone or as result of synergistic effects with other substances is toxic or produces undesirable physiological responses in human, fish or other fauna or flora. ²
- 5. All sample collection, preservation, and analysis shall be carried out in accordance with the Code of Federal Regulation (CFR) Number 40, Part 136. All chemical analyses shall be certified by a chemist licensed to practice the profession in Puerto Rico. All bacteriological tests shall be certified by a microbiologist or a medical technician licensed to practice the profession in Puerto Rico. 1,3
- No change in the design and configuration of the cages inside of production area without the previous authorization of the Environmental Quality Board (EQB).
- 7. The production system consists of ten (10) cages located within an area of 500 meters length by 500 meters width. The cages have 25 meters of diameter and 15 meters of height and are placed in two (2) rows of five (5) cages, each one, at a depth of 35 meters.

a. The production area is delineated by the following points:

Points	Geographic Coordinates (NAD 27)
Point 1	18°03′25.9" N, 65°45′24.5" W
Point 2	18°03'26.2" N, 65°46'7.5" W
Point 3	18°03'9.9" N, 65°46'7.3" W
Point 4	18°03°9.69" N, 65°45°24.3" W

b. The production area sampling points shall be situated at points 5, 6, 7, 8, 9, 10, 11 and 12, which are located at the following coordinates:

Points	Geographic Coor	dinates (NAD 27)
Point 5	18°03'26" N	65°46'19.3" W
Point 6	18 [,] 03 [,] 25.9" N	65°46'12.8" W
Point 7	18°03'22" N	65°46'7.5" W
Point 8	18°03'14" N	65°46'7.3" W
Point 9	18°03′9.9″ N	65°46'12.8" W
Point 10	18°03′9.9″ N	65 °46′1 9.3" W
Point 11	18°03'14" N	65°46′24.3" ₩
Point 12	8°03'22" N	65°46'24.5" W

c. The background sampling station shall be located one hundred (100) meters from point 1 of the production area, in the following point: 18°03'28.2" N, 65°46'27." W.

- d. The permittee shall perform current velocity measures (speed and direction) in the background sampling station during each sampling event.
- e. The permittee shall maintain records of the equipment used to be simated at the production area and background sampling points. Such records shall include the date when the equipment was obtained or leased, calibration date, serial number, model, etc.

To identify the location of the production area and background sampling points, the permittee shall use the procedure established in the EPA-QA/QC for 301 (h) Document (Table D-1 Example ZID Boundary station locations).

If the permittee determines to use another method to identify the sampling points of the production area and background, the permittee shall, prior to the utilization of such method, obtain the written approval from EQB.

- f. The samples of the eight (8) stations of the production area and the reference background monitoring station shall be taken at three (3) depths in each station: 10%, 50%, 90% of the depth.
- g. Fifteen (15) months after the Effective Date of the Permit (EDP), the permittee shall submit a report of the first year of the monitoring program. Based on the review of the monitoring results the EQB will determine if its is necessary to reopen the WQC to modify (increase or decrease) the monitoring requirements or the location and/or number of ambient monitoring stations.
- 8. Solids from the production system shall not cause deposition in the bottom of the receiving water body in such amount that be deleterious to the existing or designated uses of the receiving water body.
- 9. OHAI shall implement an annual monitoring program to determine if the solids generated due to this activity cause deposition in the bottom of the receiving water body in such amount that be deleterious to the existing or designated uses of the receiving water body. The monitoring program shall commence no later than thirty (30) days after the EQB's written approval of the Quality Assurance Project Plan (QAPP). The QAPP must be submitted for evaluation and approval of EQB no later than thirty (30) days after the EDP. The results of the monitoring program shall be

submitted to EQB no later than sixty (60) days of completion of the monitoring program. Based on the evaluation of the results obtained, EQB will determine if it is necessary to revoke the Water Quality Certificate.

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- 10. The referenced activity shall not cause the growth or propagation of organisms that negatively disturb the ecological equilibrium in the areas adjacent to the production system.
- 11. The production area shall be free of debris, scum, floating oil and any other substances that produce objectionable odors.
- 12. The permittee shall maintain the production system in good operating conditions. At least quarterly, the production system shall be inspected to determine if some repairs, replacing, etc., is required. A report of such inspections shall be submitted to the Environmental Protection Agency (EPA) and EQB no later than sixty (60) days after the performance of the inspection.
- 13. The permittee shall employ efficient feed management and feeding strategies that limit feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of animal growth.
- 14. The permittee shall dispose of accumulated solids and attached marine growth contained within or on the net-pen in a manner, which prevents to the maximum extent practical these materials from entering or reentering the receiving water body.
- 15. The permittee shall recover floating debris and trash, which enters the receiving water incidental to the operation of the facility.
- 16. The permittee shall remove and dispose of animal mortalities properly on a regular basis to prevent discharge to a water body.
- 17. The permittee shall ensure proper storage of medications, pesticides and feed in a manner that prevent spills that may result in the discharge of such substances to a water body. Also, shall implement procedures for properly containing, cleaning and disposing of any spilled material.
- 18. The EQB, can require that the permittee conduct bioaccumulation studies, dye studies, water quality studies or any other permittee will be notified to conduct such more of the aforementioned studies, the permittee will be notified to conduct such

study(ies). One hundred and twenty (120) days after the notification of the EQB, the permittee shall submit, for evaluation and approval of the EQB, a protocol to conduct such study(ies). Sixty (60) days after the EQB approval, the permittee shall conduct such study(ies). Ninety (90) days after conducting such study(ies), the permittee shall submit a report that includes the results of such study(ies).

- 19. The authorization for the production area will not be transferable and does not convey any property rights of any sort or any exclusive privileges, nor it authorizes any injury to persons or property or invasion of other private rights, of any infringement of Federal or State law or regulations.
- 20. Each condition of this WQC is considered as separate. Therefore, if the applicability of any condition of this WQC is stayed due to any circumstance, the remaining conditions of this WQC will not be affected.
- 21. The EQB, by the issuance of the WQC, does not relieve the applicant from its responsibility to obtain additional permits or authorizations from the EQB as required by law. The issuance of the WQC shall not be construed as an authorization to conduct activities not specifically covered in the WQC, which will cause water pollution as defined by the Puerto Rico Water Quality Standards Regulation (PRWQSR), as amended. 4

1, 2, 3 and 4 see next page

p. 11

MENTS NPDES NO. PR0026506	
EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS NPDES NO. PR0026506	AT THE EDGE OF THE PRODUCTION AREA
TABLE A-1	

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Duting the period beginning on and lasting through the permittee is authorized to discharge fish exercises, unconsumed fish food and medications. Such discharge shall be limited and monitored at the production area monitoring points (5, 6, 7, 9, 10, 11 and 12) by the permittee as specified below:

Receiving Water Name and Classification: Caribbean Sca, SC

Effluent Characteristics	Gross Discharge Limitations Monthly Average Daily Maximum	<u>Monitoring Requirements</u> Measurements Samp Frequency Typo	ju <u>icenents</u> Sample Type
BODs (mg/l) 123	30.0	Monthly	Grab
Color (Pt-Co Units) 23	Shall not be altered except by other than natural phenomena except when it can be proven that such change in color is harmless to biota and aesthetically acceptable.	Monthly	Grab
Copper (Cu) (µg/l) 23	3.1	Monthly	Grab
Dissolved Oxygen (mg/l) 123	Shall not contain less than 4.0 mg/l except when natural conditions cause this value to be depressed.	Monthly	Grab or in Situ
Nitrogen (NO3, NO2, NH3) (µg/l) ^{2,3}	5,000	Monthly	Grab
Oil and Grease (mg/l) 23	The waters of Puerro Rico shall be substantially free from floating non-petroleum oils and greases as well as petroleum detived oils and greases.	Monthly	Grab

TABLE A-1	EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS AT THE EDGE OF THE PRODUCTION AREA		NPDES NO. PR0026506
Receiving Water Name and Cli	Name and Classification: Caribbean Sea, SC		
Effluent Characteristics	Gross Discharge Limitations Monthly Average Daily Maximum	Monitoring Measurements Frequency	Monitoring Requirements asurements Sample requency Type
tz (NS) Hd	Shall always lie between 7.3 8.5 except when caused by natural phenomena.	Monthly	Grab or in Situ
Solids and Other Matter 2	The waters of Puerto Rico shall not contain floating debris, scum or other floating materials attributable to discharges in amounts sufficient to be unsightly or deleterious to the existing or designated uses of the water body.		
Selenium (Se) (µg/l) 23	71.0	Monthly	Grab
Suspended, Colloidal or Settleable Solids (ml/l) 123	Solids from wastewater source shall not cause deposition in or be deleterious to the existing or designated uses of the waters.	Monthly	Gmb
Taste and Odor Producing Substances ²	Shall contain none in amounts that will render any undestrable taste or odor to edible aquatic life.	1	

NPIDES NO. PR0026506		equicements Sample Type	Grab or in Situ	
		Monitoring Requirements Measutements Sample Frequency Type	Monthly	
EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS AT THE EDGE OF THE PRODUCTION AREA	Receiving Water Name and Classification: Caribbean Sea, SC	Gross Discharge Limitations Monthly Average Daily Maximum	Except by natural causes, no heat may be added to the waters of Puerto Rico, which would cause the temperature of any site to exceed 90°P (32.2°C). No thermal discharge or combination of thermal discharges into or onto the surface, estuarine and coastal waters shall be injurious to fish or shellfish or the culture or propagation of a balanced indigenous population there of nor in any way affect the	designated uses.
TABLE A-1	Receiving Water Name and	Effluent Characteristics	Temperature °F (°C) 2.3	

To comply with the monitoring requirements specified above, samples shall be taken at sampling points 5, 6, 7, 8, 9, 10, 11, and 12.

See attached sheet, which contains special conditions that constitute part of this certification.

Grab or in Situ

Monthly

10

Turbidity (NTU) 2.3

Zinc (Zn) (µg/l) 23

Special Conditions

Notes:

Grab

Monthly

81.00

1, 2, 3 and 4 see page 6 of the Special Conditions.

TABLE A-2		MONITORING REQUIREMENTS AT THE BACKGROUND SAMPLING POINT	NIS AT THE G POINT	NPDES NO. PR0026506
During the po background r	During the period beginning on background monitoring station, as specified below	and lasting through below.	the permitte	the permittee shall perform monitoring at the
Receiving Wa	Receiving Water Name and Classification. Caribbean Sea, SC	aribbean Sea, SC		·
Effluent Characteristics	racteristics		<u>Monitorin</u> Measurcments Frequency	Monitoring Requirements ments ncy Type
BOD (mg/l) 1,23	1,23		Monthly	Grab
Color (Pr-Co Units) 23	Units) 2.3		Monthly	Grab
Copper (Cu) (ug/l) 23	(ug/1) ^{2,3}		Monthly	Grab
Dissolved O	Dissolved Oxygen (mg/l) 23		Monthly	Grab or in Situ
Nitrogen (N	Nitrogen (NO3, NO2, NH3) (µg/l) 23		Monthly	Grab
Oil and Gre	Oil and Grease (nig/l) 2,3		Monthly	Grab
pH (SU) 23			Monthly	Grab or in Situ
Selenium (Se) (µg/1) 23	e) (µg/1) ^{2,3}		Monthly	Grab
Temperature °F (°C) 23	e ºF (°C) 23		Monthly	Grab or in Situ
Turbidity (NTU) 23	4TU) 23		Monthly	Grab or in Situ
Zinc (Zn) (µg/l) 23	1g/l) 2,3		Monthly	Grab

1, 2, 3 and 4 sec page 6 of the Special Conditions.

Appendix E: Water column and benthic effects modeling

Available upon request

Appendix F: Alternative site analysis

Alternative site analysis:

Ocean Harvest Aquaculture Inc. proposed to develop Cobia (*Rachycentron canadum*) on a commercial scale in open-water submerged cage systems in Puerto Rico. Six sites were evaluated by Ocean Harvest Aquaculture Inc. using collected data and a defined set of criteria. All elements within the category were sub-totaled and a grand total of all categories were compiled. Any site ranking more than 100 was considered for further study.

The alternative locations considered were:

PR1: located 3.218 688 kilometers (2 miles) off Palmas Del Mar/Yabucoa, P.R. bearing 150 degrees.

PR2: located 4.023 36 kilometers (2.5 miles) off Punta Arenas, Vieques bearing 195 degrees.

PR3: located 3.057 753 6 kilometers (1.9 miles) off Crash Boat, P.R. bearing 311 degrees.

DR1: located 2.896 819 2 kilometers (1.8 miles) off Punta Cana Resort, Dominican Republic.

DR2: located 2.414 016 kilometers (1.5 miles) off Bayahibe, Dominican Republic bearing 155 degrees.

DR3: located 2.896 819 2 kilometers (1.8 miles) off Cumayasa, Dominican Republic bearing 245 degrees.

Specification of the levels of each variable:

Bathymetry data

Water depths lower than 24.384 meters (80 ft) and more than 45.72 meters (150 ft) was considered as too shallow and too deep, respectively. Depths between 27.432-37.795 2 meters (90-124 ft) was considered as the ideal depth-range for this type of aquaculture cages operation.

Average wind velocity

Wind affects both the submerged structures and the animals under culture. Additionally, the ability to feed animals daily will be dependent on the average daily oceanic conditions. Thus, a light wind velocity is the more desirable for the cage operations since it facilitates routine work at the water surface (i.e., feeding and harvesting) that will decrease potential damage on the cage's structure. Consequently, light winds had the highest ranking values and strong winds the lowest.

Current patterns

Moderate currents and water flow are necessary to maintain water and removal of waste products from farm site. Frequent storms and turbulent seas make it difficult to practice most types of mariculture. Consequently, moderate water currents are desirable for the Ocean Harvest Aquaculture, Inc. operation helping to remove waste generated in the cages systems

while allowing the routine work (i.e., diving activities). These characteristics had the maximum ranking value.

Proximity of freshwater source such as rivers

The further away from fresh water source the more desirable. Sites closer to a source of freshwater had a lower ranking value.

Protection against hurricane passage

Areas which are highly protected from hurricane passage are desirable for aquaculture operation. However, it should be noted that these areas are limited or non-existent in Puerto Rico. Furthermore, the pathway of hurricanes are difficult to predict. Thus, the ranking given to each site was based considering the pathway of hurricane passage during the last 50 years. Sites with higher incidence of hurricane passage had the lowest ranking values.

Proximity to sensitive areas such as mangroves, coral reefs or sea grass

Distance from sensitive areas such as mangroves, coral reefs or sea grass is desirable for the any mariculture cage operations, therefore, sites located near sensitive areas decreased in ranking values.

Potential damage to big animals (sharks, dolphins, whales)

None or low potential for damage to large marine animals is desirable for any mariculture operation, consequently low damage potential had the highest-ranking value.

Proximity to mating areas for whales, turtles, or other mammals

Distant from these areas is desirable therefore; sites near mating areas had the lowest ranking value.

Sources of pollution (municipal and industrial runoff)

Sites with close proximity to run off pollution had lower ranking value.

Preliminary perception and attitudes of local authorities

Ocean Harvest Aquaculture, Inc. operation wants positive perceptions from the local authorities, therefore preliminary positive reaction from local authorities was assigned with a higher ranking values.

Support from the community

Support from the local community is a very important component of the operation, consequently sites where Ocean Harvest Aquaculture, Inc. developed good contact and support from the local community ranked higher than other sites.

Potential conflicts with the fishermen

The fishing community is an important component of the Ocean Harvest Aquaculture, Inc. operation. Consequently higher criteria values were given to sites with preliminary acceptance from the local fishing community.

Potential conflict with tourism activities

No conflict with tourism is expected. However, close proximity to any tourist area was indicated as a higher potential for conflict and distance from any tourist area was given an indication of none or low potential for conflict and therefore higher ranking scores.

Potential conflict with boat traffic

No conflict with boat traffic is expected. However, close passage of big-boats was indicated as a high potential for conflict and distant passage of big-boats was indicated as low or no potential for conflict and therefore higher ranking scores.

Availability of technical and general workforce

Ocean Harvest Aquaculture, Inc.'s operation will require a large workforce, consequently the availability of a variety of workers was an indication of a highly desirable site and therefore higher ranking scores.

Availability of roads and transportation

The availability of roads and transportation will facilitate smooth logistical operations at Ocean Harvest Aquaculture, Inc.; hence, a site with good means of transportation was highly desirable and therefore ranked higher scores.

Proximity to international airports, major distribution centers, educational facilities, ports

Close proximity to an international airports, major distribution centers, educational facilities, ports, facilitated efficient business practices for Ocean Harvest Aquaculture, Inc.; consequently, sites with availability of these infrastructure components had the highest ranking value.

Feasibility to install a hatchery facility and processing plant

Sites with high potential to develop a hatchery and processing plant facilities in close proximity to the offshore Ocean Harvest Aquaculture, Inc. site obtained higher ranking value.

Security

Safer sites obtained higher ranking value. This criterion was developed based on information from the local community.

Availability of communication, electricity, and freshwater

Availability of communication, electricity, and freshwater facilitate efficient operations at Ocean Harvest Aquaculture, Inc.; consequently, the presence of these infrastructure items obtained higher ranking scores.

Matrix rate

The site selection matrix rates each sites in five categories. Each category has from one to eleven elements to be considered. A one to five scale was used to rank the elements in each category. One represents a *negative* assumption regarding the element and a score of five represents a *positive* assumption and predicting that the higher the number the more suitable the site will be for the proposed project. A threshold was given, so that any of the proposed sites ranking over 100 points was considered for further study.

		PR 1	PR 2	PR 3	DR 1	DR 2	DR 3
	Physical factor sinclude:						
•	Bathymetry type	4	4	3	2	4	4
•	Coastal topography	4	4	3	4	2	4
•	Average and maximum wind velocity	3	4	3	4	3	4
•	Current patterns	4	4	4	2	4	3
•	Proximity of freshwater source such as rivers	3	4	3	3	3	3
•	Hurricane protection	2	2	2	2	2	2
•	Fallowing option	4	3	2	3	2	3
	U .	24	25	20	20	20	23

Biological	factors	could	include:
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•	Proximity to sensitive areas such as mangroves, coral reefs or sea grass Potential predators (sharks, dolphins, whales). Proximity to mating areas for whales, turtles, and mammals	4 4 4 12	3 4 4 11	3 3 2 8	1 3 4 8	3 3 4 10	3 3 4 10
	Chemical factors could include:						
•	Sources of pollution (municipal and industrial runoff)	4	4	3	2	4	4
	The socio-economic factor could include:						
•	Permitting process	1	1	1	4	4	4
•	Preliminary perception and attitudes of local authorities	4	3	4	4	4	4
•	Support from the community	4	3	4	3	3	3
•	Potential vandalism and poaching	4	3	3	3	2	2
•	Possible conflicts with the fishermen	4	3	3	3	4	4
•	Conflict with tourism activities	4	4	4	2	4	2
•	Conflict with boat traffic	4	4	4	3	4	3
•	Availability of technical and workforce	4 29	2 23	4 27	3 25	3 28	3 25
	Infrastructure factors could include:						
•	Availability of road	5	2	4	4	3	3
•	Transportation	4	2	4	3	3	3
•	Proximity to airports (local and international)	4	2	4	4	4	4
•	Proximity to major distribution centers	4	2	4	4	4	4
•	Proximity to educational facilities concerning the area or interest	4	2	4	3	3	3
•	Feasibility to install a hatchery facility	4	2	3	2	2	2
•	Feasibility to install a processing plants	4	3	3	3	3	3
•	Proximity to ports	4	2	4	3	3	4
•	Security	4	2	3	4	2	2
•	Availability of communication	3	2	4	3	1	2
•	Availability of electricity and freshwater	2 42	2 23	4 41	4 37	2 30	2 32
	Total all sections	111	86	99	92	92	94

Appendix G: Environmental Justice analysis

EPA Region 2 Environmental Justice Analysis

Case Study: Yabucoa and Humacao, Puerto Rico

The Region 2 Environmental Justice (EJ) Analysis supports <u>EPA Region 2's Interim</u> <u>Policy for Environmental Justice (IP)</u>. The specific community that is under evaluation for inclusion in the Region's EJ program is referred to as the Community of Concern (COC) in the IP. The analysis process hinges on the comparison of the respective levels of minority representation, low-income representation and the environmental burden of the COC relative to its statistical reference area. If the demographic analysis (first step) identifies the COC as an EJ area, then a full EJ analysis is conducted.

Demographic Analysis

The first step of EJ analysis evaluates demographic data. The analysis is conducted by comparing the demographic characteristics of a discrete, geographically defined community to its respective statistical reference area. Due to the special situation in Puerto Rico and Virgin Island, only the "percent below poverty" is applied for evaluation of a potential EJ community. The percent poverty for the COC was compared to an appropriate statistical reference, in this case Puerto Rico. The location of the COC determines which statistical reference area is used.

Demographic Analysis for Yabucoa

Indicators	Puerto Rico Thresholds	COC Indicator	Urban/Rural
Percent Minority:	NA	0	urban
Percent Poverty:	45.2	54.8	urban

Demographic Analysis for Humacao

Indicators	Puerto Rico Thresholds	COC Indicator	<u>Urban/Rural</u>
Percent Minority:	NA	0	urban
Percent Poverty:	45.2	46.1	urban

Environmental Load Profile (ELP)

A full EJ analysis entails an environmental burden analysis. Region 2 uses the concept of an Environmental Load Profile (ELP). The profile would provide a representation of the environmental load (i.e., relative environmental burden) within a community. The ELP serves to identify communities that may bear a disproportionate environmental load in comparison to statewide-derived thresholds. Currently, the ELP consists of the following three indicators: Toxics Release Inventory (TRI) Air Emissions, Air Toxics, and Facility Density. The ELP generates a summary report that provides a numeric value for the state threshold, an indicator of the community of concern (COC Indicator), and the ranking of the community in the state. These calculated values not only identify whether the particular community meets an ELP threshold, but upon exceedance, the indicator value is ranked to provide a measure of magnitude.

Ranking

In addition to quantifying the facility density indicator, a ranking system is used to provide a measure of the magnitude of the potential risk in these communities in comparison to the rest of the state. Ranking is established on a scale of 1 to 10 (i.e., one being the lowest potential risk and ten having the highest potential risk.) Communities with indicator values lower than the benchmark are ranked 0.

Establishing the Benchmark Value

The median, instead of the arithmetic mean, is used to establish a benchmark value for the facility density indicator. Data of environmental indicators typically include a small number of extremely high or extremely low values such outlying data points skew the distribution of the environmental indicator and can greatly influence the mean value. On the other hand, the median of a skewed distribution is not as heavily influenced by the outlying data points and is therefore a better representative of the entire dataset for the purposes of establishing a benchmark value.

Historically, industrial facilities were located in areas where a high percentage of minority and low income (i.e., potential EJ) populations exist. Conversely, non-potential EJ areas have less industrial facilities. A statistical analysis on the facility indicator confirms the above assumption.

Benchmark Values for Facility Density Indicator

	NY	NJ	PR	VI
State	60	83	61	65
potential EJ areas	224	338	54	49
Non-EJ areas	57	78	119	70

The median indicator value of Non-Potential EJ areas is lower than the median indicator value of Potential EJ areas in New York and New Jersey. Puerto Rico and the Virgin Islands, however, portray a different picture due to the fact that only low income data is evaluated for potential EJ areas in the Caribbean. Further, we have found overall that industries are concentrated in a number of cities where people have higher income than those in the rural sections. Nonetheless, in terms of public health, a more conservative approach was adopted to better gauge a community's health condition. For NY and NJ, the median of Non-Potential EJ areas is used as the benchmark value, while for PR and VI the median of the state is used as the benchmark.

Environmental Load Analysis for Yabucoa

Indicators	Puerto Rico Threshold	COC Indicator	Ranking
TRI Indicator:	10.48	4.82	0
Facility Density Indicator:	61	162.04	5
Air Toxics Cancer Indicator:	41	28.71	0
Air Toxics Non-cancer Indicator:	3.2	.92	0

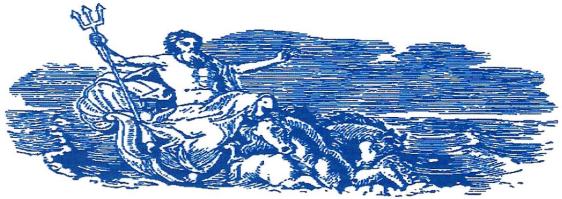
Environmental Load Analysis for Humacao

Indicators	Puerto Rico Threshold	COC Indicator	Ranking
TRI Indicator:	10.48	5.86	0
Facility Density Indicator:	61	320.65	8
Air Toxics Cancer Indicator:	41	67.3	7
Air Toxics Non-cancer Indicator:	3.2	3.13	1

The analysis indicates that some of the indicators values for the COCs are greater than the Puerto Rico thresholds. However, this proposed project does not contribute specifically to the ELP indicators.

Appendix H: Environmental Monitoring Plan

Environmental Monitoring Plan



Ocean Harvest Aquaculture Inc.

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